

Emotions, decisions, actions

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DECISIONS,
ACTIONS:
THE PSYCHOLOGY
OF
ENTREPRENEURSHIP

STELA
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Emotions, Decisions, Actions: The Psychology of Entrepreneurship

PROEFSCHRIFT

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door

Stela Ivanova Ivanova

geboren te Kazanlak, Bulgarije

Dit proefschrift is goedgekeurd door de promotoren en de samenstelling van de promotiecommissie is als volgt:

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Het onderzoek of ontwerp dat in dit proefschrift wordt beschreven is uitgevoerd in overeenstemming met de TU/e Gedragscode Wetenschapsbeoefening.

*Of the many men whom I am, whom we are,
I cannot settle on a single one.
They are lost to me under the cover of clothing
They have departed for another city.*

*When everything seems to be set
to show me off as a man of intelligence,
the fool I keep concealed on my person
takes over my talk and occupies my mouth.*

*On other occasions, I am dozing in the midst
of people of some distinction,
and when I summon my courageous self,
a coward completely unknown to me
swaddles my poor skeleton
in a thousand tiny reservations.*

*When a stately home bursts into flames,
instead of the fireman I summon,
an arsonist bursts on the scene,
and he is I. There is nothing I can do.
What must I do to distinguish myself?
How can I put myself together?*

*All the books I read
lionize dazzling hero figures,
brimming with self-assurance.
I die with envy of them;
and, in films where bullets fly on the wind,
I am left in envy of the cowboys,
left admiring even the horses.*

*But when I call upon my DASHING BEING,
out comes the same OLD LAZY SELF,
and so I never know just WHO I AM,
nor how many I am, nor WHO WE WILL BE BEING.
I would like to be able to touch a bell
and call up my real self, the truly me,
because if I really need my proper self,
I must not allow myself to disappear. (...)*

Pablo Neruda, *We are many*

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CHAPTER I

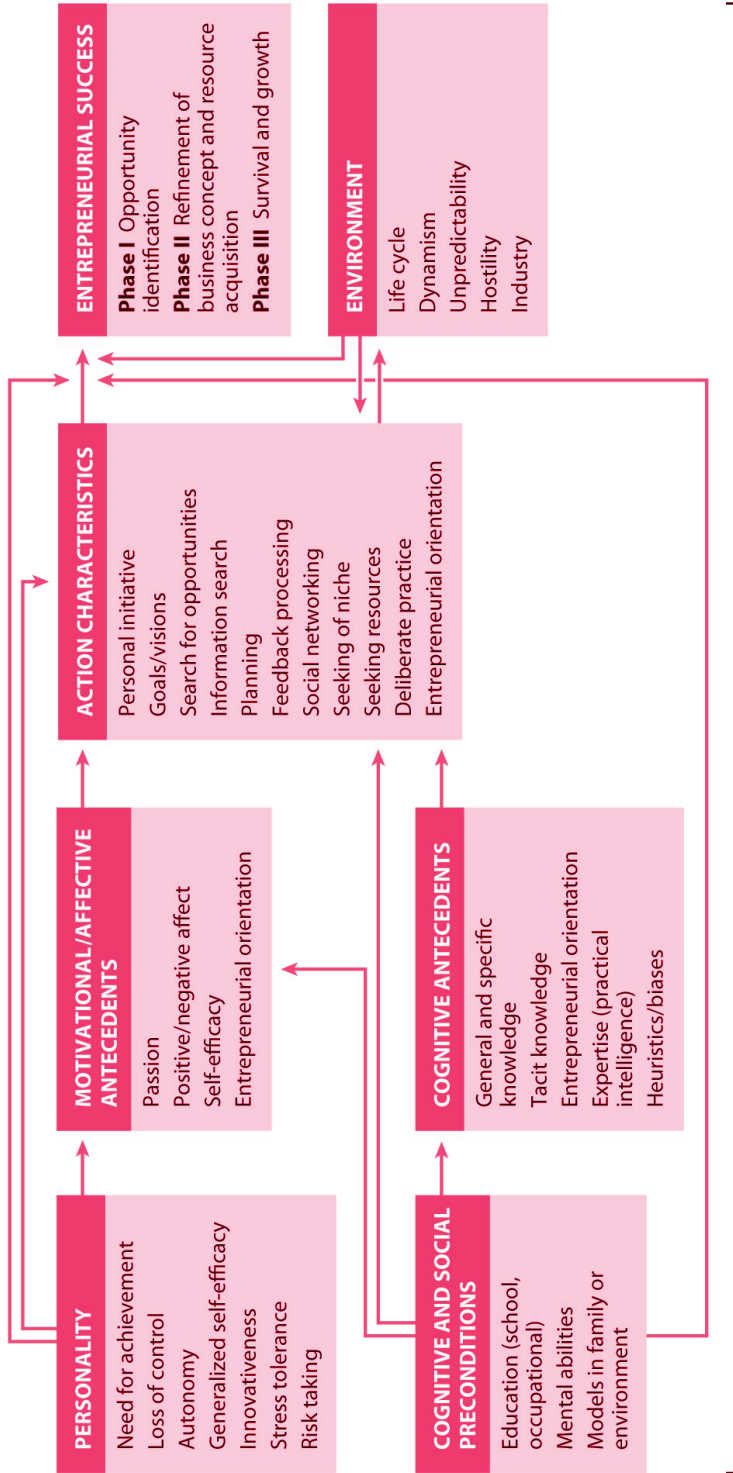
Introduction

1.1 Motivation

In its relatively short history, the field of entrepreneurship research has established itself as an interdisciplinary field. Originally, the disciplines of economics, sociology and management contributed research efforts to shed light on the new venture creation process. In more recent times, however, the creation of a new venture has been predominantly seen as a personal achievement (Baum, Frese, Baron, & Katz, 2007). This is why the discipline of psychology has come into play and has allowed to explore emotional, cognitive, motivational and behavioral level constructs that drive the entrepreneurial process toward its culmination in the creation of new ventures (Baum et al., 2007; Frese & Gielnik, 2014; Hisrich, Langan-Fox, & Grant, 2007). Many scholars have found individual psychological factors to play important roles in informing why some people decide to go into entrepreneurship and why some entrepreneurs are more successful than others in creating delete new ventures (Baron, 2000; Frese & Gielnik, 2014). However, little is known about the mechanisms behind and the interconnections between individual psychological constructs, which explain the micro-foundations of entrepreneurial action. Although economic and management theories have been useful in helping to identify what entrepreneurial action is and when it occurs, in order to answer the more micro-questions of *how* and *why* about entrepreneurial action (Mitchell et al., 2002), entrepreneurship scholars need to apply psychological theories. Grounded in psychology, this thesis aims at increased understanding of the micro-foundations of entrepreneurial action to paint a more dynamic, fine-grained, and immersed picture (Shepherd, 2015) of the entrepreneurial journey.

A dominant framework for studying new venture creation success through psychological perspective is the action-characteristics model. This model is developed by Frese and Gielnik (2014) and depicted in Figure 1.1. According to the action-characteristics model of entrepreneurship, individual psychological constructs such as personality, motivation, emotions and cognition affect new venture creation success indirectly through their effect on entrepreneurial action (Frese & Gielnik, 2014). Likewise, the environment affects new venture creation success only because it affects the way entrepreneurs act and how their actions translate to new venture creation outcomes. Therefore, entrepreneurial actions, undertaken along the process of new venture creation, are fundamental for understanding new venture creation success. Furthermore, what constitutes entrepreneurial success varies across the process of new venture creation. At each phase, entrepreneurial actions can lead to a successful transition to the next phase of new venture creation, or to a decision to withdraw from new venture creation.

The process of new venture creation entails three phases of (1) pre-launch; (2) development and execution; and (3) post-launch (Baron, 2007). Different actions and different underlying psychological constructs are likely to predict success or decision to withdraw in each phase (Gorgievski & Stephan, 2016). During the pre-launch phase, entrepreneurial action is required for successful opportunity identification. In the following phase of development and execution, entrepreneurs need to engage in actions to establish



Frse M, Gielnik MM. 2014.

Annu. Rev. Organ. Psychol. Organ. Behav. 1:413–438

Figure 1.1 The Action-Characteristics Model of Entrepreneurship (Frse, 2009)

the viability of their business structure and to acquire resources. Finally, in the post-launch phase, entrepreneurs act to establish venture survival and growth.

This thesis builds upon action-characteristics model of entrepreneurship. It unpacks entrepreneurs' actions and their constituent parts at the individual level, investigating novel interconnections between affective, cognitive and behavioral constructs in each phase of the new venture creation process. Explaining such proximal, yet still relevant to new venture creation success, micro-foundations of entrepreneurship provides an unique opportunity for psychology researchers to contribute to the development of entrepreneurship as a scientific field (Davidsson, 2016; Gorgievski & Stephan, 2016). Novel theories and theoretical models of entrepreneurship, thus, include underlying mediation mechanisms and contextual moderations to create a more comprehensive understanding of the entrepreneurship journey.

1.2 Research questions

This thesis uses a psychological perspective and it is embedded in the action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014). Therefore, this thesis is primary concerned with variations in the aspects of the individual entrepreneurs that engage in new venture creation rather than aspects of the venture. Against this background, the overall aim of this thesis is to bring novel insights into micro-foundations of the new venture creation success. In particular, I set to find out the extent to which emotions, decision and actions are interconnected to drive success during different phases of the new venture creation.

To achieve this objective, each of the three empirical studies of this thesis addresses a research question relevant to the particular phase of the new venture creation process. In line with the action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014), I put entrepreneurial action at the centre of each study, investigating either the psychological underpinnings or consequences of a particular action. The first study is set in the *pre-launch* phase of a new venture creation. During this phase entrepreneurs need to form beliefs about an existing opportunity in order to successfully identify an opportunity for new venture creation. Therefore, the first research question that this thesis answers is: How entrepreneurs come to believe that a given opportunity for new venture creation is desirable for them and whether that same opportunity is feasible for them? During the *development and execution* phase of the new venture creation, entrepreneurs take actions to define their business concept and to acquire resources, however, these actions not always lead to the successful creation of a new venture and instead many entrepreneurs disengage from the new venture creation process. Consequently, the second research question that this thesis sets to answer is: Which actions undertaken during the *development and execution* phase of the new venture creation predict shorter time to disengagement? In the *post-launch* phase of the venture, to ensure venture survival and growth, entrepreneurs need to build

and sustain viable relationships with significant others. Thus, the final research question, relevant to this phase is: How does regulation of negative emotion influence new venture co-founders' relationship viability?

1.3 Studies of the thesis

This thesis covers three studies, presented in sequence and outlined in Table 1.1. Study 1 investigates how desirability and feasibility beliefs regarding an entrepreneurial opportunity are formed based upon individual basic emotions and associated cognitive appraisals of controllability. Study 2 focuses on the time to disengagement from the new venture creation process, investigating the contextualized effects of entrepreneurs' actions. Study 3 investigates how new co-founders initiate and sustain viable relationships depending on the way they regulate their negative emotions.

1.3.1 Study 1 – Emotional Paths Leading to Opportunity Desirability and Feasibility Beliefs through Controllability

In order for entrepreneurs to act on an opportunity for a new venture creation, they need to form a belief that this opportunity is *desirable* and *feasible* for them personally. In studying the formation of desirability and feasibility beliefs about an entrepreneurial opportunity, I assume that such beliefs are likely to be formed through different emotional and cognitive processes. To confirm these assumptions, I apply the Appraisal Tendency Framework (ATF) (Lerner & Keltner, 2000; Smith & Ellsworth, 1985) to investigate the effect of three commonly experienced basic emotions, i.e., anger, fear and happiness, on desirability and feasibility opportunity beliefs via cognitive appraisal of controllability.

I investigate the distinct formation of opportunity desirability and feasibility beliefs in an online experiment ($N = 191$). The experimental methodology allows me to determine the causal relationship between emotions, controllability appraisal and opportunity beliefs. There are two main findings of this study. First, I find that desirability and feasibility opportunity beliefs are distinct but inter-related. Second, I show that anger, fear and happiness negatively influence desirability through lower controllability appraisal, however, I cannot predict feasibility through the same appraisal process.

In view of the results, this study makes three main contributions. First, I contribute to the entrepreneurial cognition literature (Mitchell et al., 2002, 2007) by demonstrating the importance of investigating first-person opportunity desirability and feasibility beliefs distinctively. Second, I contribute to the entrepreneurship literature that examines the role of psychological factors underpinning entrepreneurial action (Davidsson, 2016; Frese & Gielnik, 2014). In particular, I offer new insights into the interconnection between emotion and cognition (Baron, 2008). Third, I extend current research on the ATF (Lerner & Keltner, 2000) and argue for the need for a more precise operationalisation of the appraisal

Table 1.1 Summary of the Three Distinct Studies

| | <i>Study 1</i> | <i>Study 2</i> | <i>Study 3</i> |
|----------------------------------|---|---|--|
| Title | Emotional Paths Leading to Opportunity Desirability and Feasibility Beliefs Through Controllability | Sooner or Later? Effects of Prediction and Control on Time to Disengagement from New Venture Creation | Holding Back or Letting Go: A Social-Functional Perspective of New Venture Founders' Emotion Regulation |
| Research question | How in the <i>pre-launch</i> phase of a new venture creation do entrepreneurs come to believe that a given opportunity for technology commercialization is desirable for them and whether that same opportunity is feasible for them? | Which actions undertaken during the <i>development and execution</i> phase of a new venture creation process predict shorter time to disengagement? | In the <i>post-launch</i> phase of the venture, how does emotion regulation of negative emotion influence new venture co-founders' relationship viability? |
| Methodology | Online experiment | Harmonized Panel Data | Laboratory experiment and field survey |
| Sample size | 191 entrepreneurship students | 1748 entrepreneurs | <ul style="list-style-type: none"> • Study 3.1 – 160 undergraduate students in 80 teams; • Study 3.2 – 83 founders of new ventures. |
| Analytical approach | <ul style="list-style-type: none"> • Confirmatory factor analysis; • Bootstrap mediation model. | Cox Proportional Hazard Model | <ul style="list-style-type: none"> • Bootstrap mediation model; • Bootstrap moderated mediation model. |
| Theoretical contributions toward | <ul style="list-style-type: none"> • Entrepreneurial cognition literature; • Body of research addressing the role of emotions in the entrepreneurial process; • Appraisal Tendency Framework (ATF). | <ul style="list-style-type: none"> • New venture creation outcomes; • Strategic literature on prediction and control; • Role of context in the new venture creation process. | <ul style="list-style-type: none"> • Interpersonal effects of negative emotions in new venture creation; • Antecedents of co-founders' relationship viability in multi-founder new ventures; • Social-functional theories of emotion, the EASI model. |
| Practical implications for | <ul style="list-style-type: none"> • Entrepreneurs in the pre-launch phase of a new venture; • Entrepreneurship education. | <ul style="list-style-type: none"> • Entrepreneurs in the development and execution phase of a new venture; • Support providers. | <ul style="list-style-type: none"> • Entrepreneurs in post-launch phase of a new venture; • Support providers. |
| Publications | Published in: International Small Business Journal | To be submitted | To be submitted |
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mechanisms in general applications of the ATF. Overall, findings from this study contribute to a more fine-grained understanding of why entrepreneurs pursue the opportunities that they do as a series of intertwined cognitive properties shaped by their emotional experiences.

1.3.2 Study 2 – Sooner or Later? Effects of Prediction and Control on Disengaging from New Ventures

Disengagement from new venture creation, defined as withdrawing from and ceasing pursuit of a new venture before any profits are made from it, is a frequent phenomenon (Kollmann, Stöckmann, & Kensbock, 2017). While some entrepreneurs disengage sooner, others do so much later in the new venture creation process (Hechavarría, Matthews, & Reynolds, 2016). In this study I ask why some entrepreneurs disengage from the new venture creation process sooner than others. To answer this question I propose that increased engagement in different types of actions undertaken by the entrepreneur during new venture creation, predicts the time to disengagement (Osman, 2010). Grounded in strategic management literature, I conceptualize these actions as prediction-focused and control-focused (Kuechle, Boulu-Reshef, & Carr, 2016; Wiltbank, Dew, Read, & Sarasvathy, 2006). Furthermore, I aim for a contextualized understanding of the actions – time to disengagement relationship by exploring country-level moderations.

This study utilizes the Harmonized Panel Studies of Entrepreneurial Dynamics (PSED) from Australia, China, Sweden and USA ($N = 1748$). The PSED projects track the actions undertaken by entrepreneurs during the new venture creation process, until disengagement or censoring. Results from a Cox Proportional Hazards model suggest that increased engagement in prediction-focused actions leads to shorter time to disengagement, whereas undertaking more control-focused actions leads to longer time to disengagement. The former effect, however, is dependent on the country's level of uncertainty avoidance and entrepreneurs' engagement in control-focused actions in the condition of high uncertainty avoidance leads to reduced time to disengagement.

With this study I contribute to increased understanding of the relationship between entrepreneurial actions and new venture creation outcomes (Davidsson & Gordon, 2012; Kim, Longest, & Lippmann, 2015) by including time as an important outcome characteristic. Furthermore, I investigate the strategic management constructs of prediction and control-focused actions in relation to disengagement, which gives rise to a number of theoretical insights related to the cognitive, emotional and motivational consequences that predictive- and control-focused behaviors imply. Finally, I respond to call for incorporating contextual contingencies in the study of new venture creation (Zahra & Wright, 2011).

1.3.3 Study 3 - Holding Back or Letting Go: A Social-Functional Perspective of New Venture Founders' Emotion Regulation

Previous research in entrepreneurship has recognized that managing and regulating one's emotions is part of the actions performed by founders of new ventures (Goss, 2008). Yet, we know little about whether and how founders can regulate their negative emotions to improve interpersonal outcomes (Cardon, Foo, Shepherd, & Wiklund, 2012; De Cock, Denoo, & Clarysse, 2017). This study investigates one common strategy to regulate one's negative emotional reactions, namely expressive suppression. Drawing on the Emotions as

Social Information (EASI) model (Van Kleef, 2010), I predict that expressive suppression of negative emotions will have a negative indirect effect on co-founders' relationship through decreased perceived emotional authenticity. In line with the tenets of EASI model and the framework of entrepreneurial experience (Morris, Kuratko, Schindehutte, & Spivack, 2012), I also investigate contextual dependencies to the indirect effects.

In order to investigate the interpersonal outcomes of expressive suppression of negative emotions in new ventures, I conduct two empirical studies. First, I conduct a laboratory experiment with 80 teams, in which I find support for the immediate effect of experimentally manipulated suppression on relationship viability via decreased authenticity perceptions in a zero-acquaintance context. Second, I conduct a field survey with 83 co-founders, in which I explore the effect of habitual use of expressive suppression on relationship outcomes in a new venture creation context. The key result from Study 2 is a significant negative moderated mediation effect of suppression of negative emotion on relationship viability via perceived emotional authenticity in conditions of high frequency of negative events.

With this research I make contributions towards understanding the interpersonal effects of negative emotions in new venture creation. Furthermore, I contribute to research on multi-founder new ventures (Klotz, Hmieleski, Bradley, & Busenitz, 2014; O'Toole, Galbraith, & Lawler, 2002; Powell & Baker, 2017) by introducing perceived emotional authenticity as a determinant of co-founders' relationship viability (Foo, Sin, & Yiong, 2006). Finally, I extend and support the EASI model to the entrepreneurship field setting by showing that the premise of the model may also be applicable to expressive suppression of new venture founders' negative emotions.

1.4 Contribution of authors

This thesis has been written by doctoral student Stela Ivanova in collaboration with her supervisors and co-authors. More specifically, the three studies have been designed, conducted and written by the doctoral candidate, under the supervision of her promotor Prof. Dr. Fred Langerak and her co-promotor Assoc.-Prof. Dr. Theresa Treffers. In Study 3, the research team collaborated with Prof. Markus Groth from the University of New South Wales and Carina Raizner from Technical University of Munich. Table 1.2 presents an overview of contributors to respective studies.

1.5 Structure of thesis

The main chapters of this thesis (i.e., Chapter 2, 3 and 4) contain the three empirical studies. Chapter 5 integrates the findings of the aforementioned studies, explores their theoretical and practical implications, and answers each of the research questions. This

Table 1.2 Overview of (co-)Authors and their Key Contributions

| | | <i>Design of the study</i> | <i>Literature review</i> | <i>Data collection</i> | <i>Data analysis</i> | <i>Interpretation of results</i> | <i>Writing main text</i> | <i>Corrections and feedback</i> |
|--------------|------------------|----------------------------|--------------------------|------------------------|----------------------|----------------------------------|--------------------------|---------------------------------|
| Introduction | Stela Ivanova | | | | | | X | X |
| | Theresa Treffers | | | | | | | X |
| | Fred Langerak | | | | | | | X |
| Study 1 | Stela Ivanova | X | X | X | X | X | X | X |
| | Theresa Treffers | X | | | | | | X |
| | Fred Langerak | | | | | | | X |
| Study 2 | Stela Ivanova | X | X | X | X | X | X | X |
| | Theresa Treffers | | | | | | | X |
| | Fred Langerak | | | | | | | X |
| Study 3 | Stela Ivanova | X | X | X | X | X | X | X |
| | Theresa Treffers | | | X | | | | X |
| | Fred Langerak | | | | | | | X |
| | Markus Groth | | | X | | | | X |
| | Carina Raizner | | | X | | | | |
| Discussion | Stela Ivanova | | | | | | X | X |
| | Theresa Treffers | | | | | | | X |
| | Fred Langerak | | | | | | | X |

thesis concludes by offering suggestions for further research and some recommendations for practical applications. The chapters are written to be readable separately, outside of the context of this thesis.



CHAPTER 2

Emotional Paths Leading to Opportunity Desirability and Feasibility Beliefs through Controllability^{1,2}

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- 1 Ivanova, S., Treffers, T., & Langerak, F. (2018). Emotional paths leading to opportunity desirability and feasibility beliefs through controllability. *International Small Business Journal: Researching Entrepreneurship*, 36(5), 546–573. doi:10.1177/0266242617751596
 - 2 This chapter is written in British English.

ABSTRACT

Extant studies promote opportunity belief as an antecedent of entrepreneurial action. However, we do not sufficiently understand how beliefs about the desirability and feasibility of an entrepreneurial opportunity are formed. We argue that desirability and feasibility are related but distinct micro-foundations of entrepreneurial action formed through different cognitive-emotional mechanisms. Drawing on the appraisal tendency framework, we investigate the indirect effects of three basic emotions (anger, fear and happiness) on desirability and feasibility through the appraisal tendency of controllability. In an experimental study ($N = 191$) we find evidence for the distinctiveness and interconnectedness of desirability and feasibility beliefs. In addition, our findings show that desirability can be predicted by emotions through controllability, but we cannot predict feasibility through the same appraisal process. Our study seeks insights concerning how desirability and feasibility beliefs about an entrepreneurial opportunity are distinctively formed based on the inner cognitive and emotional processes of individuals.

Keywords: appraisal tendencies, emotions, opportunity desirability, opportunity feasibility

2.1 Introduction

Entrepreneurs act on opportunities for new venture creation if they believe that exploiting a given opportunity will bring them to a desired end state successfully (Shaver & Scott, 1992). Opportunity beliefs thus consist of future-focused subjective judgment of the desirability and feasibility of an entrepreneurial opportunity. Yet, how do entrepreneurs come to believe that a given opportunity is desirable for *them* or whether that same opportunity is feasible for *them*? Current research on desirability and feasibility predominantly pertains to the domain of entrepreneurial intentions (Dutta, Gwebu, & Wang, 2015; Fitzsimmons & Douglas, 2011) and offers critical insights into why some people, but not others, decide to pursue entrepreneurship as a career path (Liñán & Fayolle, 2015). However, we do not yet understand sufficiently why some entrepreneurs would pursue a specific entrepreneurial opportunity, whereas others would not, although in practice, this frequently occurs. It is important to study how beliefs about the desirability and feasibility of an entrepreneurial opportunity are formed to better understand when entrepreneurs act on a specific entrepreneurial opportunity.

In studying the formation of desirability and feasibility beliefs about an entrepreneurial opportunity, we argue that such beliefs are likely to be formed through different emotional and cognitive processes. Emotions have been shown to play an important role in influencing entrepreneurial cognition (Cardon et al., 2012; Doern & Goss, 2013; Foo, 2011; Kollmann et al., 2017; Welpe, Spörrle, Grichnik, Michl, & Audretsch, 2012). At the same time, entrepreneurship research has made important steps in investigating individual-level cognitive processes that result in a decision to undertake entrepreneurial action (Shepherd, Williams, & Patzelt, 2015). Entrepreneurship scholars jointly investigating the roles of emotions and cognitions in the entrepreneurial process have increasingly applied the appraisal tendency framework (ATF) (Foo, 2011; Podoyntsyna, Van der Bij, & Song, 2012). It is important to make a distinction between cognitive appraisals, defined by cognitive appraisal theory (Roseman & Evdokas, 2004), and appraisal tendencies, defined by ATF (Lerner & Keltner, 2000; 2001). Temporally, cognitive appraisals precede and cause emotion elicitation. Appraisal tendencies occur only after emotion is elicited; they refer to the predisposition to appraise future events in line with the cognitive appraisals that characterise the emotion (Lerner & Tiedens, 2006; Winterich, Han, & Lerner, 2010). In this study, we refer to the latter. The ATF provides a basis for predicting how appraisals elicited by emotions can alter the level at which information is construed in subsequent judgement tasks (Han, Lerner & Keltner, 2007; Labroo & Patrick, 2009; Lerner, Han & Keltner, 2007; Lerner & Keltner, 2000). Although the ATF acknowledges that emotions can have multiple appraisal tendencies and that different emotions can share an appraisal tendency, this point implies that there is no 'fixed effect' of the same emotion. Hence, the effect of one emotion could vary based on which appraisal tendency is relevant to the judgement context (So et al., 2015). However, such distinction between emotions in terms of their underlying

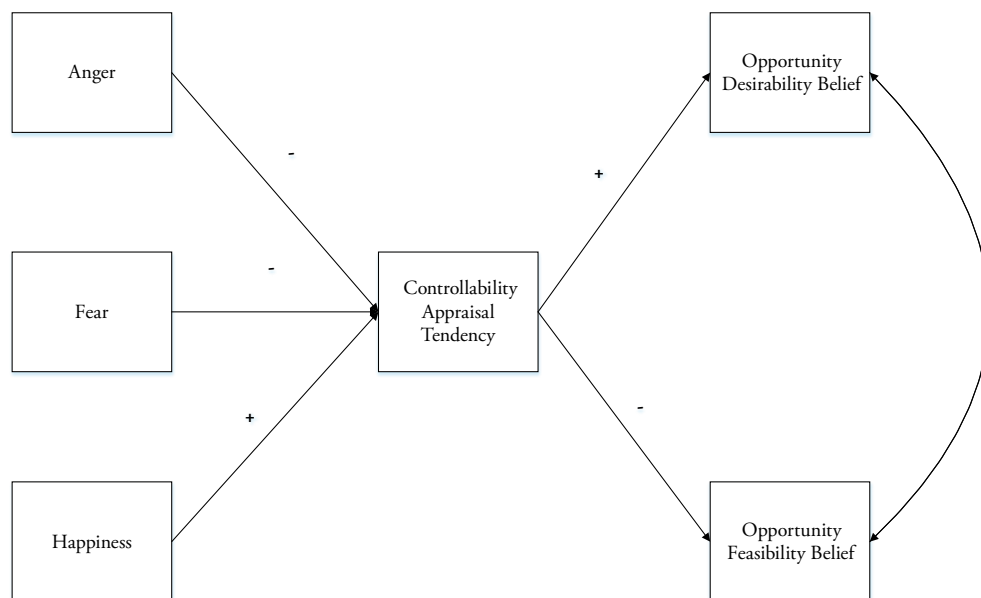
appraisals has, thus far, not consistently been considered in entrepreneurship research (Welpe et al., 2012). Yet, this is important to capture the complex, multi-dimensional nature of emotions and their effect upon judgment (So et al., 2015).

Our study addresses this gap and investigates the role of three commonly experienced discrete basic emotions (anger, fear and happiness) (Angie, Connelly, Waples, & Kligyte, 2011), which have distinct associations with appraisal tendencies for the formation of desirability and feasibility beliefs. Emotions are likely to affect cognition when their appraisal is consistent with the object of the judgment (Dunn & Schweitzer, 2005). Previous research has found that entrepreneurs tend to categorise as opportunities those situations characterised by controllability (Jackson & Dutton, 1988). We therefore, focus upon controllability appraisals as most relevant to the context of first-person opportunity belief formation (So et al., 2015) and investigate controllability appraisal as a mediator in the relationship between emotions and desirability and feasibility beliefs.

We test our hypotheses using an online experiment ($N = 191$) that includes an emotion induction, measurement of appraisal tendency of controllability and measurement of first-person desirability and feasibility beliefs concerning an entrepreneurial opportunity. The results of our study affirm the distinctiveness and interconnectedness of desirability and feasibility beliefs. Furthermore, our findings show that desirability is predictable from induced emotions through the controllability appraisal but we cannot predict feasibility through the same appraisal process.

This article makes three main contributions. First, we contribute to the entrepreneurial cognition literature (Mitchell, Mitchell, & Smith, 2008) by demonstrating the importance of investigating first-person opportunity desirability and feasibility beliefs distinctively. Focussing on desirability and feasibility beliefs sheds light on new facets of entrepreneurial cognition which are the micro-foundations of entrepreneurial action. We also make an initial important step in measuring first-person desirability and feasibility. Second, we contribute to the entrepreneurship literature that examines the role of psychological factors in the entrepreneurial process (Davidsson, 2016; Frese & Gielnik, 2014). In particular, we offer new insights into the role of emotions in entrepreneurial cognition (Baron, 2008) by showing how basic emotions influence the formation of opportunity belief. Third, we extend current research on the ATF (Lerner & Keltner, 2000). Hypothesising that appraisal-driven effects of emotions on opportunity-related judgments and resulting beliefs can be different, we extend the application of ATF to the entrepreneurship literature. In addition, our results speak to the need for a more precise operationalisation of the appraisal mechanisms in general applications of the ATF. Altogether, our findings contribute to a more fine-grained understanding of why entrepreneurs pursue the opportunities that they do as a series of intertwined cognitive properties shaped by their emotional experiences.

The article is structured as follows. We first position our study in the literature on the cognitive and emotional micro-foundations of entrepreneurial action. In particular, we develop a conceptual framework based on the ATF from which we derive three



Note: Reference group for emotions is neutral emotional state.

Figure 2.1 Conceptual Model

hypotheses about the relationships between emotions, controllability appraisal and opportunity desirability and feasibility. In the method section, we outline the experimental procedure, the experimental materials and measures. In the subsequent section, we present our findings and test our hypotheses, applying confirmatory factor analysis (CFA) and mediation analysis. In the discussion section, we discuss our findings and offer explanations for unexpected and non-significant results. We conclude with implications for practice and suggestions for future research.

2.2 Theory and hypotheses

To develop richer insights into the micro-level cognitive foundations of entrepreneurial action, we build on the ATF to propose the conceptual model in Figure 2.1. In essence, we draw attention towards opportunity desirability and opportunity feasibility as distinct but related constructs, supported by arguments from the entrepreneurial action model (Dimov, 2010; Klein, 2008; McMullen & Shepherd, 2006) and construal-level theory (Liberman & Trope, 1998). We also propose a cognitive-emotional mediation process that influences the formation of these first-person future-oriented beliefs. Leveraging arguments from ATF, we predict that anger, fear and happiness exert effects on desirability and feasibility beliefs through their appraisals of controllability (Ellsworth & Smith, 1988; Lerner & Keltner, 2000; Smith & Ellsworth, 1985).

2.2.1 Opportunity desirability and opportunity feasibility beliefs

The idea of a first-person opportunity belief was introduced by McMullen & Shepherd (2006) to refer to an entrepreneur's judgment that an existing opportunity is coherent with his or her value and knowledge structure. Opportunity belief arises from increasing personal conviction of both the desirability and feasibility of the entrepreneurial opportunity (Stevenson & Jarillo, 1990). It reduces the uncertainty barrier inherent to potential entrepreneurs (McMullen & Shepherd, 2006) by fostering a feeling of security in entrepreneurial action (Hayton & Cholakova, 2012). It is, therefore, essential to move beyond the objective characteristics of entrepreneurial opportunities (Grégoire & Shepherd, 2012; Wood, Williams, & Drover, 2017) and broad categories of entrepreneurial cognition (Grégoire, Shepherd, & Schurer Lambert, 2009; McCann & Vroom, 2015; Mitchell et al., 2002; Wood & McKelvie, 2015) towards future-oriented cognitive judgments of narrower opportunity considerations. These result in beliefs that a given opportunity is desirable and feasible for oneself.

Building on insights from the entrepreneurial action model (Shepherd, McMullen, & Jennings, 2007) and construal-level theory (Liberman & Trope, 1998), we seek to conceptually distinguish desirability belief from feasibility belief about an entrepreneurial opportunity. In the entrepreneurial action model, *desirability* is the belief that the successful exploitation of an opportunity would fulfil personal desires (McMullen & Shepherd, 2006; Shepherd et al., 2007). The formation of desirability belief is based on judgment about the reward or the goal of opportunity exploitation; hence, desirability can explain the motivational *why* aspect of entrepreneurial action. Drawing on insights from construal-level theory (Liberman & Trope, 1998), forming a desirability belief involves an abstract, distant future representation of the opportunity (Fujita, Trope, Liberman & Levin-Sagi, 2006; Labroo & Patrick, 2009; Tumasjan, Welppe & Spörrle, 2013). Hence, opportunity desirability belief is formed when the entrepreneur thinks about a distant future moment when this opportunity will have already been exploited and considers in abstract terms its potential reward (Tumasjan et al., 2013). The desirability of the future reward, expected when exploiting the opportunity, is affected by the person's current psychological state or by some enduring individual need (Shepherd et al., 2007).

In contrast, *feasibility* is the belief that exploiting an opportunity is possible with the means that the entrepreneur possesses (Grégoire et al., 2009; Mitchell & Shepherd, 2010). It explains the *how* aspect of entrepreneurial action (Liberman & Trope, 1998). Although desirability belief relates to the goal of opportunity exploitation, feasibility belief pertains to the means used for opportunity exploitation. That is, feasibility is a function of the perceived knowledge, skills, abilities and resources possessed by the entrepreneur relative to the knowledge, skills, abilities and resources required by the opportunity (Haynie, Shepherd, & McMullen, 2009). With greater similarity between the two, the potentially desirable opportunity appears more feasible (Mitchell & Shepherd, 2010). According to construal-level theory, the formation of feasibility belief is based on concrete-level, near-

future representation of the opportunity (Liberman & Trope, 1998; Trope, Liberman & Wakslak, 2007). The means needed to achieve successful exploitation are assessed in the near future, when opportunity exploitation begins (Förster, Friedman, & Liberman, 2004).

Although we provide theoretical arguments above addressing why desirability and feasibility beliefs are distinct, we also theorise that they are positively related. Guided by Bandura's (1977) social learning theory, we know that a person who values a reward that is conditional on attaining a certain goal prefers to persist in his or her efforts to achieve this goal. Hence, an entrepreneur who values the potential rewards of opportunity exploitation (i.e. high desirability) should exert more effort in exploiting the opportunity with the given means (i.e. high feasibility) (Edelman & Yli-Renko, 2010). In turn, believing that exploiting this opportunity is achievable (i.e. high feasibility) contributes to a stronger motivational drive to exploit the opportunity (i.e. desirability) (Townsend, Busenitz, & Arthurs, 2010). Taken together, these arguments lead to the following hypothesis:

H1: Opportunity desirability belief and opportunity feasibility belief are distinct but positively related constructs.

2.2.2 Emotions, appraisal of controllability and the formation of opportunity desirability and feasibility beliefs

Role of emotion in entrepreneurial cognition. In general, entrepreneurs have been argued to be more susceptible to falling prey to their emotions in the early stages of their entrepreneurial career because they are constrained by their lack of entrepreneurial experience and overwhelmed by information (Westhead, Ucbasaran, & Wright, 2005). Indeed, studies have shown that entrepreneurs' emotions affect opportunity risk assessments (Foo, 2011; Podoyntsyna et al., 2012) or processing and evaluation of new persuasive opportunity information (Kollmann et al., 2017; Welpé et al., 2012). In particular, previous research has found that anger, fear and happiness directly predict opportunity-related judgments (Foo, 2011; Grichnik, Smeja & Welpé, 2010; Welpé et al., 2012). In addition, there is a general consensus that these emotions meet all defining criteria for a discrete basic emotion (Tracy & Randles, 2011), being unique experiential states that occur with minimal cognitive or behavioural regulation of distinct causes (Izard, 1977) and spark different action tendencies (Izard, 1992; Stein & Oatley, 1992). Therefore, we study the effect of these basic emotions in the formation of opportunity beliefs.

Previous studies on the role of psychological factors such as emotions in early stage entrepreneurship (Baron, 2008) have found no clear direction in the relationship between anger, fear or happiness and entrepreneurial cognition. Despite its negative valence, anger has most often been found to relate positively to opportunity exploitation (Welpé et al., 2012) and risk perception (Foo, 2011). These findings speak towards the approach motivation of anger (Harmon-Jones & Sigelman, 2001), which predicts activism (Lebel & Ronel, 2009),

and fuels new venture creation effort (Alvord, Brown, & Letts, 2004). Considering the distinctive explanations of how emotions drive action tendencies versus (Frijda, 1986) how they colour interpretation of stimuli (Lerner & Keltner, 2000), the literature does not help us to understand the role of anger in entrepreneurial judgment processes such as those resulting in desirability and feasibility belief formation. Conversely, fear has been clearly shown to influence both cognitive and behavioural outcomes. Even when induced by a random external event, fear increases risk perception in pursuing an entrepreneurial opportunity (Foo, 2011), reduces opportunity evaluation (Kollmann et al., 2017) and reduces subsequent opportunity exploitation (Welppe et al., 2012). Finally, happiness has been commonly addressed as an antecedent of entrepreneurial action (Baron, Hmieleski, & Henry, 2012) or as an intense feeling in the context of entrepreneurial passion (Cardon et al., 2009). In entrepreneurial cognition research, happiness has been found to be associated positively with opportunity evaluation (Grichnik et al., 2010). However, other studies have suggested that happiness influences the exploitation intentions in either a positive (Welppe et al., 2012) or a negative (Grichnik et al., 2010) direction.

Appraisal tendency framework. Our investigation of the effect of anger, fear and happiness on the formation of opportunity beliefs is guided by the ATF (Lerner & Keltner, 2000). According to the ATF, how emotions colour cognitive processes is defined by their underlying appraisal tendencies (Han et al., 2007). These appraisal tendencies systematically influence subsequent judgments and persuasion (Han, Duhachek, & Agrawal, 2014) regardless of whether the emotion is related or unrelated to that judgment (Cavanaugh, Bettman, Luce, & Payne, 2007; Garg, Inman, & Mittal, 2005). For example, fear is characterised by appraisals of uncertainty and lack of control (Smith & Ellsworth, 1985). In a risk judgment, the experience of fear will activate appraisal tendencies of uncertainty and lack of control and lead to an increased risk estimate (Foo, 2011; Lerner, Gonzalez, Small & Fischhoff, 2003). In particular, Lerner & Tiedens (2006) note that appraisal tendencies can influence judgment through altering either the cognitive content or the cognitive process. More-recent studies advocate delineating the specific path through which appraisal tendencies of emotions influence judgment (So et al., 2015). What follows is an argumentation of the effect of controllability on future-oriented cognitive processes that result in the formation of opportunity desirability and feasibility beliefs.

Effect of emotions on controllability. Researchers agree on six core dimensions that define the appraisal tendencies of emotions: certainty, pleasantness, attentional activity, controllability, anticipated effort and responsibility (Smith & Ellsworth, 1985). Of these, the *controllability* appraisal tendency is widely researched (Lerner & Keltner, 2001; Lerner & Tiedens, 2006). It reflects the extent to which one possesses control over an event's outcome (Dunn & Schweitzer, 2005). Controllability is associated with experiencing different basic emotions (Frijda, 1993; Izard, 1992; Lazarus, 1991; Smith & Ellsworth, 1985; Weiner, 1985). When

people feel happy or remember feeling happy, they appraise their situation as being of their own doing (Baas, de Dreu, & Nijstad, 2012). In contrast, people feeling angry or fearful appraise their situation as not under their control (Lerner & Keltner, 2000; Smith & Ellsworth, 1985). We accordingly anticipate (see also Figure 2.1) that anger and fear invoke a similar appraisal of lack of control, whereas happiness initially indicates control over the situation. Hence, anger and fear will contribute negatively to *controllability appraisal*, whereas happiness will contribute positively to *controllability appraisal*.

Effect of controllability on opportunity beliefs. Previous research findings indicate that controllability is an important construct in entrepreneurship (Baron, Mueller, & Wolfe, 2016), which is not surprising considering that most entrepreneurs are initiators who take responsibility for their own welfare (Mueller, 2001). Prior research also indicates that a sense of controllability relates positively to business creation and success (Rauch & Frese, 2007).

We argue that controllability also plays a role in entrepreneurial cognition. Jackson & Dutton (1988), for example, found that organisational decision makers tend to categorise as opportunities those situations characterised by controllability (Jackson & Dutton, 1988). According to Bandura's (1997) social cognitive theory, controllability shapes subjective expectancies about future outcomes. Hence, we suggest that controllability also influences future-oriented first-person opportunity judgment of 'what will be' if one is to exploit a given opportunity (Autio, Dahlander & Frederiksen, 2013; Haynie et al., 2009; Keh, Foo & Lim, 2002; Martin & Wilson, 2016; Mitchell & Shepherd, 2010), which ultimately leads to the formation of opportunity desirability and feasibility beliefs.

Some suggest that controllability leads to a generalised subjective expectation that good things will occur (Urbig & Monsen, 2012; Weinstein, 1980) and therefore, has a positive effect on future-oriented cognition. Others argue, in contrast, that controllability can lead entrepreneurs to reduce their natural inclination to self-enhancement and result in a lower likelihood of engaging in optimistic future-oriented cognition (Baron et al., 2016). We reconcile these contradicting arguments by suggesting that controllability can simultaneously influence future-oriented cognition desirability and feasibility beliefs in opposing ways.

Controllability and opportunity desirability. We argue that by signalling that a situation is under one's control, controllability appraisal allows people to distance themselves psychologically from the situation. A sense of controllability leads to reduced doubt and failure aversion (Van Gelderen, Kautonen, & Fink, 2015), which triggers construal of situations as benign and psychologically distant (Herzog, Hansen & Wänke, 2007; Trope et al., 2007). Psychological distancing results in taking a broader perspective, or seeing the 'big picture' (Bar-Anan, Liberman & Trope, 2006; Liberman, Sagristano & Trope, 2002; Trope & Liberman, 2003; Trope et al., 2007). Thus, controllability increases distant future thinking or abstract construal, resulting in a positive effect on desirability belief.

In summary, anger and fear should be negatively associated with controllability appraisal. The lower controllability appraisal tendency in turn produces unfavourable effects on belief that a given opportunity will bring about a desired end goal. In contrast, happiness positively influences the activation of controllability appraisal tendency. Happy entrepreneurs likely form higher desirability belief. Formally,

H2a: Anger and fear will have negative indirect effects on opportunity desirability belief via controllability appraisal.

H2b: Happiness will have a positive indirect effect on opportunity desirability belief via controllability appraisal.

Controllability and opportunity feasibility. By focussing attention on the big picture, controllability reduces attention towards proximal or concrete information and allows entrepreneurs to restrain overly positive assessments of their own abilities (Baron et al., 2016). In contrast, near-future, concrete-level construal of a situation is triggered in threatening situations when controllability is low (Herzog et al., 2007; Trope et al., 2007). Therefore, the formation of feasibility belief is dampened by controllability appraisal, which diverts attention away from concrete-level considerations of the opportunity.

The lower controllability appraisal induced by anger and fear in turn produces favourable effects on the belief that exploitation of an opportunity is possible with the means that the entrepreneur has available. Thus, when signalling a lack of control over what is happening, anger and fear can boost the entrepreneur's belief in the feasibility of successful opportunity exploitation. Because happiness positively influences the activation of controllability appraisal tendency, happy entrepreneurs likely form lower feasibility belief. Formally,

H3a: Anger and fear will have positive indirect effects on opportunity feasibility belief via controllability appraisal.

H3b: Happiness will have a negative indirect effect on opportunity feasibility belief via controllability appraisal.

2.3 Method

2.3.1 Sample

The study conducted an online experiment with 258 entrepreneurship students from a Dutch university. The average age of students in the sample was 20 years, with 16% women and 11% from countries other than the Netherlands (e.g. Belgium, China, Greece and Italy). Most participants (86%) had no entrepreneurial experience. All received

course credit for their participation. Sampling university undergraduates is a common practice in experimental research (Colquitt, 2008). University undergraduates represent a homogeneous sample allowing control over the decision environment, which is otherwise difficult to achieve in naturally occurring settings (Falk & Heckman, 2009). Furthermore, entrepreneurship student samples have relatively homogeneous entrepreneurial intention levels (Souitaris, Zerbinati, & Al-Laham, 2007) and are known to have a high potential for engaging in entrepreneurial activity (Edelman, Manolova, Shirokova, & Tsukanova, 2016; Lerner, 2016). These characteristics, combined with similar (minimal) entrepreneurial knowledge (von Graevenitz, Harhoff, & Weber, 2010), make entrepreneurship students a suitable sample for studying opportunity-related cognitive processes such as the formation of opportunity beliefs (Dimov, 2007b). Finally, the entrepreneurship programme at this university is open to students from all faculties, which also provides us with sufficient educational heterogeneity in the sample (Dimov, 2007b).

2.3.2 Experimental procedure

To test our hypotheses, we conducted an online between-subject experiment, which is well suited to examining specific entrepreneurial judgment (Kraus, Meier, & Niemand, 2016) conservatively (Charness, Gneezy, & Kuhn, 2012). All participants were randomly assigned to one of four independent experimental conditions, anger ($N = 60$), fear ($N = 67$), happiness ($N = 70$), or neutral ($N = 61$). At the start of the experiment, participants were subject to an emotion induction procedure taken from Lerner & Keltner (2001). Next, participants completed a scale to measure their controllability appraisal. We then presented participants with experimental instructions, followed by a description of an opportunity for new venture creation. After participants had read the description, we asked them to complete questions about the desirability and feasibility of this entrepreneurial opportunity. At the end of the experiment, we questioned the participants concerning their opportunity-related knowledge, entrepreneurial experience and demographics, and asked them whether the opportunity description was realistic for them.

2.3.3 Experimental materials and measures

Emotion induction. To induce participants into angry, fearful, happy and neutral states, we applied the autobiographical recall emotion induction procedure (Lerner & Keltner, 2001). In this procedure, participants are instructed to respond to two open-ended items: '(1) Describe three to five things that make you most angry/fearful/happy', and '(2) Describe in more detail the one situation that makes you, or has made you, the most angry/fearful/happy.' Participants in the neutral emotion condition answered two questions in the same format, which requested them to describe three to five situations that occur on a daily basis and provide a more detailed description of one such situation. We excluded five participants who did not follow the instructions (i.e. they could not recall any situations).

Pre-test of emotion induction. Self-reporting of emotions can reduce the effect of emotion inductions by making participants aware of their emotions (Gasper & Clore, 2002), can create suspicion about the experiment's purpose among the main study sample (Dunn & Schweitzer, 2005; Foo, 2011) or can stimulate experiment demand effects (Larsen & Sinnett, 1991). Therefore, we pre-tested our emotion induction procedure on a sample of 125 students from the same entrepreneurship course who did not participate in the main study. Participants were randomly assigned to one of the four emotion conditions (anger, fear, happiness and neutral). After they completed the autobiographic recall emotion induction procedure, they rated the extent to which they experienced anger, fear and happiness using the PANAS-X scales (Watson & Clark, 1994). A multivariate analysis of variance using pairwise least significant difference post-hoc tests indicated significant, medium to large effects of the emotion induction on self-reported anger, fear and happiness (please see Appendix 1.1 for more details). Hence, our emotion induction procedure successfully induced the desired emotional states.

Controllability appraisal. We measured controllability appraisal with one item, which was adapted from previous ATF-based research on the effect of emotions on various cognitive processes (Dunn & Schweitzer, 2005; Lerner & Keltner, 2001; Smith & Ellsworth, 1985). We asked participants to indicate to what extent they agreed that they were in control of the situation they described during the emotion induction procedure on a seven-point Likert scale ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Experimental instructions. We used experimental instructions adapted from Dimov (2007b) to ensure that factors related to the desirability and feasibility of entrepreneurship as a career choice were standardised across participants. Hence, we control for potential confounds related to the effects of entrepreneurial intentions on first-person, opportunity-related desirability and feasibility beliefs. Before reading about the entrepreneurial opportunity, all participants read that (1) they are interested in starting their own business, given the right business opportunity (entrepreneurship desirability); (2) start-ups in their area have recently received investments from venture capital firms (entrepreneurship feasibility); (3) as students, they are in a position to start a business that might not generate income initially (entrepreneurship feasibility); and (4) starting their own business would bring significant tax benefits (entrepreneurship desirability).

Entrepreneurial opportunity. We developed a description of an entrepreneurial opportunity based on characteristics most commonly used by novice and experienced entrepreneurs in opportunity-related cognition (e.g. technology newness, alignment between the functional characteristics of the technology with the functional needs of the market, risk and profitability) (Baron & Ensley, 2006). The opportunity was described as an alignment between a technology, Logic PLS, and a market need (Grégoire et al., 2009; Grégoire & Shepherd, 2012; Wood

& Williams, 2014). The invention originated at the university at which the experiment was conducted, and its inventor contributed to the development of the opportunity description (see Appendix 1.2 for a full description of the entrepreneurial opportunity).

We excluded 48 participants from our sample because they spent on average only 13.13 seconds reading the entrepreneurial opportunity, whereas 60 seconds represents an average expected reading time for a text of 400 words (our entrepreneurial opportunity description is 399 words) (Graesser, Hoffman, & Clark, 1980).

Pre-test of entrepreneurial opportunity. To ensure the face validity and clarity of the opportunity description, we conducted a pre-test with a sample of 31 students from the same Dutch university who did not participate in the main study or in the pre-test of the emotion induction procedure. All participants read the description of the entrepreneurial opportunity and then answered questions about its third-person opportunity desirability and feasibility, technology newness, alignment between the functional characteristics of the technology with the functional needs of the market, opportunity risk, profitability and text clarity (Baron & Ensley, 2006). The feedback led us to make minor adjustments to the opportunity description. We then tested it again by conducting interviews with six nascent entrepreneurs and five entrepreneurship academics. All interviewees indicated that the opportunity was clear and understandable. In addition, all nascent entrepreneurs viewed the opportunity description as plausible.

Dependent variables. Because no validated measures of first-person desirability or feasibility beliefs are currently available, we adapted an opportunity recognition belief scale developed and validated by Grégoire et al. (2009) (see Appendix 1.3 for more details about the measurement of the dependent variables). Ultimately, we used three items to measure opportunity desirability belief ($\alpha = 0.69$) and three items to measure opportunity feasibility belief ($\alpha = 0.70$). All items used seven-point Likert scales ranging from 'Strongly disagree' (1) to 'Strongly agree' (7).

Control variables. Drawing on one's prior experience and knowledge is a common judgment tactic in any entrepreneurial cognitive process (Ardichvili, Cardozo & Ray, 2003; Baron & Ensley, 2006; Gruber, MacMillan & Thompson, 2008); hence, we control for technology and market knowledge and for entrepreneurial experience. Knowledge related to the technology and market were each assessed with two items (Grégoire & Shepherd, 2012). Participants indicated on a seven-point Likert scale, from 'Minimal' (1) to 'Considerable' (7) the extent to which they had prior knowledge about the technology, the scientific and engineering principles underpinning the technology, the market of interest and the problems affecting this market. In addition, we measured prior entrepreneurial experience as months of self-employment, which revealed that 86% of our sample did not have any entrepreneurial experience, whereas the remaining 14% reported experience ranging from

one month to six years. The large number of zeros and positive skewness of this variable led us to create a dummy variable equal to 0 for those with no experience and 1 for those with some experience. We also asked participants to indicate their age, gender, nationality and the entrepreneurial experience of their parents.

Finally, to check whether the presented opportunity description was realistic for all participants, we included the following item at the end of the experiment: ‘Applying the technology to the targeted market is a realistic business opportunity.’ We asked participants to rate this statement on a seven-point Likert scale (1 = ‘Strongly disagree’ to 7 = ‘Strongly agree’). We excluded 14 participants who indicated unrealistic perceptions of the presented opportunity (scores of 3 or lower), which significantly affected their opportunity desirability belief ($F(1, 203) = 2.11, p < 0.001$). A chi-square test ($\chi^2(3) = 4.40, p = 0.22$) reveals that there is no statistically significant association between any experimental condition and unrealistic opportunity perceptions. Thus, our final sample contains 191 participants (anger = 41, fear = 54, happiness = 50, neutral = 46).

2.4 Results

2.4.1 Reliability and validity

We subjected all multiple indicator measures in our study, namely desirability, feasibility, technology knowledge and market knowledge, to a CFA. These constructs all tap into first-person opportunity judgments; hence, CFA is a suitable method to establish the distinctiveness of opportunity-related judgments and to assess the reliability and convergent and discriminant validity of our measurements.³

Reliability. Table 2.1 reports the composite reliability scores of our dependent variables. They are greater than 0.7, which is the minimum requirement for adequate reliability (Daily, Johnson, & Dalton, 1999). The Cronbach’s alpha scores for desirability and feasibility also are close to the minimum threshold of 0.7 (Nunnally & Bernstein, 1994). Hence, our scales for measuring opportunity desirability and feasibility beliefs are reliable.

Convergent and discriminant validity. We examine convergent validity by estimating whether each item’s estimated path coefficient on its posited underlying construct is significant (Anderson & Gerbing, 1988). In support of convergent validity, each path loading reported in Table 2.1 was greater than twice its standard error (standard errors ranged from 0.07 to 0.13).

Checking for discriminant validity, we compared the square root of each construct’s average

3 We removed one of the feasibility items (“I find Logic PLS sufficiently developed to be able to apply it in the targeted market”) because the CFA showed low standardised regression weight.

Table 2.1 Confirmatory Factor Analysis Results

| <i>Construct</i> | <i>Item</i> | <i>Standardised Regression Weight</i> | <i>Composite Reliability</i> | <i>Cronbach's Alpha</i> |
|--|---|---|----------------------------------|-----------------------------|
| Opportunity desirability belief | Applying Logic PLS in the targeted market constitutes a profitable business opportunity for me. | 0.53 | 0.73 | 0.69 |
| | Successful exploitation of this business opportunity will adequately fulfil my personal desires. | 0.61 | | |
| | Applying Logic PLS in the targeted market is a desirable business opportunity for me. | 0.90 | | |
| Opportunity feasibility belief | I am confident that I can perform the tasks necessary to achieve a successful exploitation of this opportunity. | 0.68 | 0.71 | 0.70 |
| | I believe that I have the knowledge needed to exploit this business opportunity successfully. | 0.89 | | |
| | Applying Logic PLS in the targeted market constitutes a feasible business opportunity for me. | 0.40 | | |
| Opportunity knowledge (technology) | Knowledge about the technology . | 0.87 | 0.84 | |
| | Knowledge about the scientific and engineering principles underpinning the technology . | 0.83 | | |
| Opportunity knowledge (market) | Knowledge about the market of interest | 0.93 | 0.85 | |
| | Knowledge about the problems affecting this market and current solutions to this problem | 0.79 | | |

variance extracted (AVE) with the absolute value of its standardised correlations (Fornell & Larcker, 1981). Because the square root of the AVE for each construct in the correlation matrix (Table 2.2) was greater than any off-diagonal correlations in the corresponding row or column, our measures achieved adequate discriminant validity.

2.4.2 Hypothesis testing

The means, standard deviations, and correlations of all variables in this study are shown in Table 2.2. The relationship between desirability and feasibility was significantly positive ($r = 0.37, p < 0.01$). Desirability was also significantly, positively related to controllability ($r = 0.15, p < 0.05$). Controllability was negatively related to anger ($r = -0.23, p < 0.01$) and fear ($r = -0.49, p < 0.01$) but positively related to happiness ($r = 0.26, p < 0.01$). Correlation results suggest no critical collinearity between independent variables in our data (i.e., $r > 0.80$, according to Kennedy, 2003). In addition, using ordinary least squares (OLS) regression with desirability belief or feasibility belief as dependent variables, variance inflation factors (VIFs) for all of the independent variables were clearly less than the critical value of 10 (Hair, Black, Babin, & Anderson, 2006) (highest VIF was 2.53 for fear) and indicate that multicollinearity was unlikely to be a concern in our study.

Hypothesis 1 states that desirability and feasibility beliefs are distinct but positively related constructs. The results of the test for discriminant validity already indicate that the two constructs are distinct. To further test the distinctiveness of the constructs, we assessed the fit of two different models using CFA. The results indicated that a model

with four correlated constructs (desirability, feasibility, technology knowledge and market knowledge) offers the best fit for the data ($\chi^2(27) = 34.6, p = 0.15$; root mean square error of approximation (RMSEA) = 0.04; standardised root mean square residual (SRMR) = 0.05; comparative fit index (CFI) = 0.99; Tucker-Lewis Index (TLI) = 0.98) in comparison with a single factor model ($\chi^2(33) = 56.54, p < 0.01$; *RMSEA* = 0.06; *SRMR* = 0.11; *CFI* = 0.96; *TLI* = 0.95). The distinctiveness of desirability and feasibility, as indicated by the CFA and the test for discriminant validity, together with their significant positive correlation ($r = 0.37, p < 0.01$), provide support for Hypothesis 1.

To test the indirect effects of anger, fear and happiness on desirability and feasibility via the controllability appraisal as predicted in H2 and H3, we used an SPSS macro programme (Preacher & Hayes, 2008). This procedure relies on bootstrapping to identify the indirect effects of anger, fear and happiness. It computes indirect effect as a product of the direct effect of each emotion on controllability and the direct effect of controllability on desirability or feasibility (Preacher & Hayes, 2008).

We ran two sets of analyses, one for each dependent variable, and included the other in each model as a covariate. Each set of analyses had three iterations, one for each emotion condition, with the remaining two emotions included as covariates. Anger, fear and happiness were included in the models as dummy variables, with neutral emotional state as the reference condition. All three emotions exert significantly negative direct effects on appraisals of controllability, regardless of whether the dependent variable was desirability (Table 2.3: anger $b = -2.62, p < 0.001$; fear $b = -3.33, p < 0.001$; happiness $b = -0.80, p < 0.05$) or feasibility (Table 2.4: anger $b = -2.68, p < 0.001$; fear $b = -3.28, p < 0.001$; happiness $b = -0.79, p < 0.05$). Controllability appraisal had a significantly positive direct effect on desirability ($b = 0.12, p < 0.05$) but no significant influence on feasibility ($b = 0.05, p = 0.25$).

To test the significance of the indirect effects of anger, fear and happiness on desirability and feasibility through controllability appraisal, we used a bias-corrected bootstrapping procedure with 10,000 samples (Preacher & Hayes, 2008). The analyses demonstrate significantly negative indirect effects of anger (standardised indirect effect = -0.10, bias corrected 95% confidence interval (BCa 95% CI) = (-0.20, -0.03)) and fear (standardised indirect effect = -0.14, BCa 95% CI = [-0.26, -0.03]) on desirability through controllability appraisal in support of H2a. However, happiness also has a significantly negative indirect effect on desirability through controllability appraisal (standardised indirect effect = -0.03, BCa 95% CI = (-0.09, -0.01)), in contrast with H2b. The lower and upper confidence intervals of the indirect effects of all three emotions on feasibility include 0, indicating that they are non-significant (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). We thus cannot support H3a or H3b. In another unexpected result, in addition to its negative, indirect effect on desirability through controllability appraisal, anger also has a significantly positive direct effect on desirability ($b = 0.52, p < 0.05$).

We found no significant effect of entrepreneurial experience ($b = 0.01, p = 0.95$), technology knowledge ($b = 0.06, p = 0.39$) or market knowledge ($b = 0.07, p = 0.26$) on

Table 2.2 Means (M), Standard Deviations (SD), Average Variance Extracted (AVE), and Pearson Correlations of Study Variables

| | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------------------------------|-------|------|-------------|-------------|-------------|---------|--------|-------|--------|--------|--------|--------|-------|--------|
| (1)Desirability | 4.63 | 1.07 | <u>0.70</u> | 0.37** | 0.15* | 0.08 | -0.04 | -0.03 | 0.01 | 0.26** | 0.26** | 0.06 | 0.07 | 0.06 |
| (2)Feasibility | 4.01 | 1.20 | <u>0.69</u> | <u>0.07</u> | 0.07 | -0.03 | 0.05 | -0.02 | 0.00 | 0.49** | 0.45** | 0.21** | 0.05 | 0.06 |
| (3)Controllability | 3.37 | 2.08 | | -0.23** | -0.49** | 0.26** | 0.47** | 0.04 | 0.09 | 0.04 | 0.09 | -0.08 | 0.01 | -0.05 |
| (4)Anger | 0.21 | 0.41 | | -0.33** | -0.31** | -0.29** | -0.07 | 0.02 | 0.02 | -0.02 | -0.02 | -0.01 | -0.01 | 0.02 |
| (5)Fear | 0.28 | 0.45 | | -0.37** | -0.35** | 0.01 | -0.11 | 0.02 | -0.04 | 0.06 | -0.04 | 0.06 | -0.04 | 0.06 |
| (6)Happiness | 0.26 | 0.44 | | -0.34** | -0.00 | -0.03 | 0.04 | 0.02 | 0.02 | -0.12 | -0.03 | 0.04 | 0.02 | -0.12 |
| (7)Neutral | 0.24 | 0.43 | | | 0.06 | 0.12 | -0.05 | 0.04 | 0.04 | 0.05 | 0.12 | -0.05 | 0.04 | 0.05 |
| (8)Knowledge (market) | 3.39 | 1.44 | | | <u>0.87</u> | 0.53** | 0.08 | 0.11 | -0.05 | 0.05 | 0.53** | 0.08 | 0.11 | -0.05 |
| (9)Knowledge (technology) | 2.62 | 1.23 | | | | 0.85 | 0.10 | -0.03 | 0.20** | 0.05 | 0.85 | 0.10 | -0.03 | 0.20** |
| (10)Entrepreneurial experience | 0.14 | 0.34 | | | | | 0.22** | 0.09 | 0.02 | 0.02 | | 0.22** | 0.09 | 0.02 |
| (11)Age | 19.99 | 2.27 | | | | | | | | | | | | |
| (12)Gender (male) | 0.84 | 0.37 | | | | | | | | | | | | |

Notes: The underlined numbers on the diagonal are the square roots of the average variance extracted (AVE).

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, all correlations are two-tailed.

Table 2.3 Direct, Indirect and Total Effects of Emotions and Controllability on Desirability

| | | <i>Desirability</i> | | <i>Controllability</i> | |
|--------------------------------------|----------------------------|---|----------------------------|--|-------------------------------|
| | | <i>Coefficient</i> ⁴ | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Direct effects (DV = Desirability) | Constant | 2.65 | 0.36 | 4.50 | 0.47 |
| | Entrepreneurial experience | 0.01 | 0.21 | -0.53 | 0.35 |
| | Knowledge (technology) | 0.06 | 0.07 | 0.01 | 0.12 |
| | Knowledge (market) | 0.07 | 0.06 | -0.07 | 0.10 |
| | Feasibility | 0.24** | 0.07 | 0.22 | 0.12 |
| | Controllability | 0.12* | 0.05 | | |
| | Anger | 0.52* | 0.24 | -2.62*** | 0.34 |
| | Fear | 0.32 | 0.25 | -3.33*** | 0.33 |
| | Happiness | 0.07 | 0.21 | -0.80* | 0.33 |
| | | $R^2 = 0.19; F(8, 182) = 5.22, p < 0.001$ | | $R^2 = 0.44; F(7, 183) = 20.31, p < 0.001$ | |
| Indirect effects (DV = Desirability) | | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit 95%CI</i> | <i>Boot Upper Limit 95%CI</i> |
| | Anger | -0.10** | 0.04 | -0.20 | -0.03 |
| | Fear | -0.14** | 0.06 | -0.26 | -0.03 |
| | Happiness | -0.03* | 0.02 | -0.09 | -0.01 |
| Total effects (DV = Desirability) | | <i>Coefficient</i> | <i>Standard Error</i> | | |
| | Constant | 3.18 | 0.30 | | |
| | Entrepreneurial experience | -0.05 | 0.22 | | |
| | Knowledge (technology) | 0.06 | 0.07 | | |
| | Knowledge (market) | 0.06 | 0.06 | | |
| | Feasibility | 0.27*** | 0.07 | | |
| | Anger | 0.21 | 0.22 | | |
| | Fear | -0.08 | 0.20 | | |
| Happiness | -0.02 | 0.21 | | | |
| | | $R^2 = 0.16; F(7, 183) = 4.88, p < 0.001$ | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed.

desirability. However, we find a significantly positive effect of entrepreneurial experience ($b = 0.52, p < 0.05$), technology ($b = 0.22, p < 0.01$) and market ($b = 0.25, p < 0.001$) knowledge on feasibility.

Finally, we used G*Power 3.0.10 to obtain the post hoc statistical power of the effects of our treatment variables based on the effect sizes and sample sizes (Faul, Erdfelder, Buchner, & Lang, 2009). We had 99% power in detecting the smallest significant $R^2 = 0.12$, given $\alpha = 0.05$.

4 Coefficients are unstandardised betas. Reporting unstandardised coefficients in mediation analysis with dichotomous independent variables is recommended. Standardised coefficients for dichotomous variables generally have no useful substantive interpretations (Darlington & Hayes, 2016).

Table 2.4 Direct, Indirect and Total Effects of Emotions and Controllability on Feasibility

| | | <i>Feasibility</i> | | <i>Controllability</i> | |
|-------------------------------------|----------------------------|--|--|-------------------------------|--|
| | | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Direct effects (DV = Feasibility) | Constant | 1.06 | 0.39 | 3.73 | 0.58 |
| | Entrepreneurial experience | 0.52* | 0.21 | -0.45 | 0.34 |
| | Knowledge (technology) | 0.22** | 0.07 | 0.01 | 0.11 |
| | Knowledge (market) | 0.25*** | 0.06 | -0.05 | 0.10 |
| | Desirability | 0.24** | 0.07 | 0.33* | 0.11 |
| | Controllability | 0.05 | 0.05 | | |
| | Anger | 0.15 | 0.24 | -2.68*** | 0.34 |
| | Fear | 0.40 | 0.25 | -3.28*** | 0.32 |
| | Happiness | 0.10 | 0.20 | -0.79* | 0.32 |
| | | | $R^2 = 0.37; F(8, 182) = 13.40, p < 0.001$ | | $R^2 = 0.45; F(7, 183) = 21.63, p < 0.001$ |
| Indirect effects (DV = Feasibility) | | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit 95%CI</i> | <i>Boot Upper Limit 95%CI</i> |
| | Anger | -0.05 | 0.05 | -0.15 | 0.04 |
| | Fear | -0.0 | 0.06 | -0.20 | 0.06 |
| | Happiness | -0.02 | 0.02 | -0.06 | 0.01 |
| Total effects (DV = Feasibility) | | <i>Coefficient</i> | <i>Standard Error</i> | | |
| | Constant | 1.26 | 0.36 | | |
| | Entrepreneurial experience | 0.50* | 0.21 | | |
| | Knowledge (technology) | 0.22** | 0.07 | | |
| | Knowledge (market) | 0.25*** | 0.06 | | |
| | Desirability | 0.25*** | 0.07 | | |
| | Anger | 0.01 | 0.21 | | |
| | Fear | 0.22 | 0.20 | | |
| Happiness | 0.06 | 0.20 | | | |
| | | $R^2 = 0.37; F(7, 183) = 15.09, p < 0.001$ | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed.

2.5 Discussion

We conducted an experimental study to investigate how opportunity desirability and feasibility beliefs form based on emotional and cognitive processes. We find evidence of desirability's and feasibility's distinctiveness and support for their interconnectedness. In addition, desirability can be predicted by emotions through the appraisal of controllability, but we cannot predict feasibility through the same cognitive-emotional process. Our findings have theoretical implications for psychological research in entrepreneurship and practical implications for entrepreneurs and teachers.

2.5.1 Theoretical implications

Our finding that desirability and feasibility are distinct but positively related constructs aligns and extends the current literature on entrepreneurial cognition (Baron & Ward, 2004; Grégoire, Corbett, & McMullen, 2011). Scholars have conceptually distinguished between these constructs as distinct components of entrepreneurial opportunity beliefs (McMullen & Shepherd, 2006; Shepherd et al., 2007). However, most empirical studies have focussed predominantly on the formation of overall belief of opportunity attractiveness (Gruber, Kim, & Brinckmann, 2015; Wood, McKelvie, & Haynie, 2014) and treated desirability and feasibility as objective opportunity characteristics (Tumasjan et al., 2013; Welp et al., 2012). Based on insights from the entrepreneurial action model (Shepherd et al., 2007) and construal-level theory (Förster et al., 2004), our theoretical arguments that desirability and feasibility are distinct because they result from judging different aspects of the opportunity at different cognitive levels of abstraction were supported in our empirical analyses. Thus, our results also contribute towards an initial establishment of measurement scales for first-person desirability and feasibility opportunity beliefs. Overall, our results suggest that to fully understand key aspects of entrepreneurship, it is necessary to consider the effects of variables operating at a micro level of entrepreneurial cognition (Baron et al., 2012). Hence, failing to disentangle desirability and feasibility conceptually and empirically can lead to premature and incorrect conclusions about first-person opportunity beliefs and thus, about entrepreneurial action.

Furthermore, this article adds to a growing body of literature in entrepreneurship that examines the role of psychological factors in the entrepreneurial process (Davidsson, 2016; Frese & Gielnik, 2014). In particular, we offer new insights into the role of emotions in entrepreneurial cognition (Baron, 2008) by showing how discrete basic emotions influence the formation of opportunity belief. The need to understand how emotions affect cognition is all the more pressing considering that most entrepreneurs are unaware of their emotions (Hayton & Cholakova, 2012). In fact, people generally lack awareness of the effects of their emotions on their cognition – and in many cases even deny the possibility (Winterich et al., 2010). In particular, we find that anger, fear and happiness influence the formation of opportunity desirability belief through a negative effect on controllability appraisal (Lerner & Keltner, 2000; Smith & Ellsworth, 1985). When an entrepreneur is angry, fearful or happy, he/she appears to feel powerless over the potential outcomes of opportunity exploitation. This lower controllability prevents the entrepreneur from focussing on the distant future considerations for exploitations hence, lowering his or her desirability belief that this opportunity exploitation is worthwhile. This finding is in line with previous research indicating that negative emotion such as fear decreases evaluation of the opportunity of the entrepreneurs (Grichnik et al., 2010; Kollmann et al., 2017). However, it also contradicts prior evidence that positive emotions such as happiness increase opportunity evaluation (Foo, 2011; Grichnik et al., 2010) and thereby, provides a useful point for comparing the multidimensional nature of emotions across judgment contexts. In the context of our

study, unlike previous research, emotions are investigated in relation to first-person, future-focussed judgments. It is possible that under the influence of happiness, entrepreneurs find opportunities attractive (Grichnik et al., 2010) but not personally desirable because their contentment with the present restricts them from visualising the future.

However, we did not find support for the indirect effects of anger, fear or happiness on feasibility through controllability appraisals. We offer two *ex-post* explanations for these findings. First, a probable explanation from the ATF is that the appraisal tendency of controllability is not sufficient in explaining the indirect effect of anger, fear and happiness on feasibility. Other appraisal tendencies, such as certainty, might instead be more instrumental to predict the formation of feasibility belief. Certainty appraisal, activated by emotions such as pride (Smith & Ellsworth, 1985), might facilitate the formation of higher feasibility belief. As entrepreneurs feel more certain, they are likely to believe more strongly in the possibility of opportunity exploitation with the means that they possess. Second, it might be possible that the feasibility belief is less transient than is the desirability belief. If so, this point would have important implications for the theory and practice of entrepreneurship. For theory, it would be important to investigate further the role of emotion in entrepreneurial cognition to understand what specific judgments are influenced by one's emotion states and under what conditions does this influence occur. High-stake situations, for example, are particularly potent source of emotions that can override the effect of previously experienced, unrelated emotions (e.g. the experimentally induced emotions in our study) (Cavanaugh et al., 2007). Entrepreneurs might find the judgment of feasibility to have more important consequences compared with the judgment of desirability. Hence, they are likely to experience more pressure during the formation of feasibility belief, which could in turn block the effect of previously experienced emotions. For practice, this implication would suggest that some entrepreneurial judgments are less prone to psychological influences from unrelated events and that it might be advisable for entrepreneurs to focus on comparatively stable judgments in emotionally turbulent times. Taken together, our findings demonstrate that emotions influence entrepreneurial cognition, depending upon the underlying psychological process that they activate.

Finally, our results make a twofold contribution to ATF. First, we support the differentiation of emotions in terms of their underlying appraisals (Lerner & Keltner, 2000; Smith & Ellsworth, 1985) as an important consideration in entrepreneurship research (Foo, 2011; Welpel et al., 2012). Second, we also find evidence contradicting the current state of research on the ATF (Lerner & Keltner, 2000; Smith & Ellsworth, 1985). Some existing research assumes that anger and happiness invoke similar appraisals of controllability (Baas et al., 2012), whereas fear invokes low controllability (Horberg, Oveis, & Keltner, 2011). Our findings suggest however that, relative to a neutral state, anger, fear and happiness all signal lower controllability. Because basic emotions are intense and short-lived (Baron, 2008), any emotion would typically be characterised with less controllability compared with a neutral state that is experienced during habitual events. Therefore, we call on researchers

to measure and specify the relationships between basic emotions and core dimensions of appraisal tendencies.

2.5.2 Practical implications

Our results have implications for entrepreneurship practice and education. First, it is important to draw entrepreneurial awareness to micro-level cognitive properties of the *why* and *how* of entrepreneurial opportunities. It is important for entrepreneurs to recognise that the desirability and feasibility of an entrepreneurial opportunity are results of subjective processes that are open to the influence of his/her emotions and cognitions. This point might contrast with an entrepreneur's views that the evaluation of an entrepreneurial opportunity depends upon objective characteristics. Recognising the subjectivity of the opportunity evaluation, entrepreneurs must then also consider how their emotions will influence their judgments about the desirability and feasibility of an opportunity. If an entrepreneur experiences, for instance, fear, anger or happiness, his or her desirability to exploit an entrepreneurial opportunity decreases. However, entrepreneurs should also know that their belief about the feasibility of an opportunity is less likely to be influenced by their emotions.

In addition to understanding the effects of their emotions on the formation of their desirability and feasibility beliefs about an entrepreneurial opportunity, entrepreneurs also obtain insights into the cognitive processes that drive this relationship. Their emotions are related to appraisals of controllability, which influences how far in the future the opportunity is envisioned. Thus, controllability appraisal shapes their opportunity beliefs. This knowledge can help entrepreneurs to focus on the controllability of the entrepreneurial opportunity rather than on their emotional state, because this focus particularly influences their desirability belief. Overall, our study's findings help entrepreneurs to understand how their desirability and feasibility beliefs form, how these beliefs are influenced by their emotions and which cognitive considerations are relevant.

Second, our results have implications for entrepreneurship education. Typically, entrepreneurship programmes focus on teaching concepts such as business plans, business opportunities and strategies for obtaining venture finance. Although students often develop critical skills pertaining to these concepts, such as evaluating business opportunities from a third-person perspective, our study also highlights a need to incorporate first-person opportunity evaluations. This approach would imply that students learn the difference between entrepreneurial opportunities that objectively represent attractive opportunities and judging entrepreneurial opportunities that are desirable and feasible for them. Related to this learning objective is the recommendation to teach entrepreneurship students the necessary skills to judge adequately the desirability and feasibility of an entrepreneurial opportunity. Such skills would include the intrapersonal component of emotional intelligence (Petrides & Furnham, 2003), that is, one's ability to recognise and regulate one's own emotions. This skill can be enhanced by educating entrepreneurs about cues

for recognition of emotions in one's self, affective self-monitoring techniques (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011) and training on different strategies for emotion regulation and their trade-offs (Richards, Butler, & Gross, 2003).

2.6 Limitations and future research

A few limitations are worth noting when interpreting our results. Because this study is one of few to investigate the distinctive processes of desirability and feasibility belief formation, our operationalisation of the dependent variables needs further elaboration. For example, our study measured desirability and feasibility simultaneously, so we cannot determine the causal relationship between desirability and feasibility. Further research therefore, might explore the causality in forming opportunity desirability and feasibility beliefs and the transition from belief formation into entrepreneurial action (Hatak & Snellman, 2017). It will be interesting to undertake additional experimental studies that test for the causality of desirability and feasibility beliefs and for the effect of emotions on opportunity beliefs mediated by different appraisals, for example, certainty under different conditions of judgment importance, as suggested in the discussion of our unexpected results.

Although our experimental study has high internal validity in testing the causal effects of emotions on belief formation (Campbell, Stanley, & Gage, 1966), our experiments are also limited in their external validity. Presenting participants with an opportunity description cannot fully represent a situation in which an entrepreneur judges an opportunity in his or her own domain of knowledge and interest according to its desirability and feasibility. Hence, we hope that future studies will replicate our findings in a field study with nascent entrepreneurs who are in the actual process of judging their entrepreneurial opportunity. Nevertheless, using scenarios in opportunity evaluation research is a common practice (Gupta, Goktan & Gunay, 2014; Wood & Williams, 2014) because doing so can minimise confounding effects from opportunity variability to reveal cognitive processes unique to entrepreneurship (Shane, Locke, & Collins, 2003).

Finally, we used a student sample to test our hypotheses, a practice often subject to criticism in entrepreneurship research because of the limited generalisability of the hypotheses to non-student populations such as entrepreneurs (Segal, Borgia, & Schoenfeld, 2005). For our study, however, which investigates universal psychological processes of potential entrepreneurs, a student sample is appropriate because this population is likely to engage in the entrepreneurial process as potential entrepreneurs. Hence, we do not expect any qualitative changes in our findings with a different sample such as employees. In a sample of active entrepreneurs, our findings might additionally be affected by factors that are specifically related to entrepreneurs such as passion (Cardon et al., 2009; Cardon, Zietsma, Saporito, Matherne & Davis, 2005) or overoptimism (Baron et al., 2012; Hmieleski & Baron, 2009).

2.7 Conclusions

Overall, the article investigated how desirability and feasibility beliefs regarding an entrepreneurial opportunity are formed based upon individuals' basic emotions and associated appraisals of controllability. Entrepreneur emotions of fear, anger and happiness lead to a decrease in opportunity desirability belief because of their associated perception of low control over situational outcomes. However, entrepreneurial opportunity feasibility belief is not influenced by the same appraisal process. Thus, our study contributes to a more fine-grained understanding of the emotional and cognitive processes leading to the formation of opportunity beliefs that will ultimately determine entrepreneurial action.



CHAPTER 3

Sooner or Later? Effects of Prediction and Control on Time to Disengagement from New Venture Creation⁵

ABSTRACT

This study investigates the time to disengagement from venture creation by focusing on the contextualized effects of entrepreneurs' actions. Drawing from strategic management literature, we test hypotheses about the effects of prediction-focused and control-focused actions on the time to disengagement using the harmonized Panel Study of Entrepreneurial Dynamics (PSED) from four countries. The results show that the more prediction-focused actions entrepreneurs undertake, the shorter their time to disengagement will be, whereas the more control-focused actions they undertake, the longer their time to disengagement will be. However, the former relationship varies according to the country's level of uncertainty avoidance. These results shed new light on the roles of prediction and control-focused actions for the underexplored outcome of disengagement from venture creation and provide ample implications for aspiring entrepreneurs, educators, financiers and support providers.

Keywords: new venture creation, disengagement, prediction, control, uncertainty avoidance.

3.1 Introduction

Disengagement from new venture creation – withdrawing from and ceasing pursuit of a new venture before any profits are made from it – is a frequent phenomenon in the venture creation process (Yusuf, 2012). Some entrepreneurs disengage sooner, whereas others continue active effort on unprofitable ventures for a long time (Hechavarría et al., 2016). The time to disengagement from an unprofitable venture may have important implications for both founders and potential shareholders, such as lenders, employees, customers, and suppliers, so it is important to understand why some entrepreneurs disengage sooner than others (Balcaen, Manigart, & Ooghe, 2011). For example, the sooner that entrepreneurs withdraw from unprofitable venture creation, the lower their sunk costs (Reynolds, 2016b) and the less the threat to their health and well-being (Miller & Wrosch, 2007). Furthermore, delaying the disengagement and persisting with the unprofitable venture can consume scarce personal resources that could be otherwise directed to the pursuit of other endeavors (DeTienne, 2010; Wrosch, Scheier, Carver, & Schulz, 2003), such as the start of other new ventures (Hayward, Forster, Sarasvathy, & Fredrickson, 2010; Hessels, Grilo, Thurik, & van der Zwan, 2011; Hsu, Wiklund, & Cotton, 2017; Ucbasaran, Shepherd, Lockett, & Lyon, 2013). Therefore, it is important for entrepreneurs to determine the viability of their ventures as soon as possible and, if necessary, to disengage as quickly as possible.

To determine venture viability, entrepreneurs need to engage in actions (Shepherd et al., 2007). Previous research has investigated how taking action leads to (positive) performance outcomes, including organizational emergence (Arenius, Engel, & Klyver, 2017; Brush, Manolova, & Edelman, 2008; Carter, Gartner, & Reynolds, 1996; Delmar & Shane, 2003; Lichtenstein, Carter, Dooley, & Gartner, 2007), generation of sales and positive cash flow (Carter et al., 1996; LeBrasseur et al., 2003), resource acquisition (Bowey & Easton, 2007), growth (Susan Mueller, Volery, & von Siemens, 2012), and product–market fit (Mauer et al., 2018). The inference is that engaging in actions drives entrepreneurs away from disengagement and toward the establishment of profitable ventures. Previous research has failed to support this empirically and has thereby neglected the very common outcome that entrepreneurs disengage from their ventures (Carter et al., 1996; Davidsson & Gordon, 2016; Van Gelderen, Thurik, & Patel, 2011; Yusuf, 2012). Not all acts of entrepreneurial pursuit result in profitable ventures, and disengaging from unprofitable ventures takes more time than establishing profitable ones (Hechavarría et al., 2016; Shim & Davidsson, 2018). Hence, it remains an open question how different types of actions relate to the time to disengagement.

In line with strategic management literature (Brinckmann, Grichnik, & Kapsa, 2010; Kuechle et al., 2016; Mauer et al., 2018; Mintzberg & Waters, 1985; Sarasvathy, 2001; Wiltbank et al., 2006), we conceptualize the actions of entrepreneurs along the two independent dimensions of prediction and control, depending on their focus on different aspects of the pursuit for new venture creation (Chandler, 1962; Andrews,

1971; Brews & Hunt, 1999). Increased engagement in prediction-focused actions, such as gathering information to estimate probabilities and precisely defining future events, results in reducing uncertainty about the goal of new venture creation (Delmar & Shane, 2003; Osman, 2010). Increased engagement in control-focused actions, such as altering probabilities and constructing entirely new events, results in obtaining more control over the means of new venture creation (Knight, 1921; Mauer et al., 2018; Mintzberg & Waters, 1985; Sarasvathy, 2001; Wiltbank et al., 2006). The ongoing debate between prediction and control occurs largely in the context of performance-effect testing (Brews & Hunt, 1999; Gruber, 2007; Read, Song & Smit, 2009; Burke, Fraser & Greene, 2010; Honig & Samuelsson, 2012; Perry, Chandler & Markova, 2012; Greene & Hopp, 2017), rather than in the roles they play in disengagement from venture creation. We argue that an increased engagement in prediction or control-focused actions is associated with cognitive, emotional and motivational consequences, which influence entrepreneurs' time to disengagement from new venture creation.

Context affects entrepreneurial behavior (Schneider & De Meyer, 1991; Zahra & Wright, 2011). An overall context for new venture creation is the country in which a new venture is being established (Liñán & Fernandez-Serrano, 2014). With the increase of cross-border business activities (McDougall & Oviatt, 2000) and policy changes providing support for small and medium enterprises seeking to internationalize (Wright et al., 2007), gaining understanding of cross-country variations in new venture creation is ever more pressing. Accordingly, we investigate how the relationship between prediction-focused and control-focused actions and the time to disengagement might vary across countries, depending on their level of uncertainty avoidance (Brinckmann et al., 2010; Honig & Karlsson, 2004).

To achieve these objectives we use a five-cohort, outcome-harmonized dataset drawn from the Panel Study of Entrepreneurial Dynamics (PSED). The PSED follows entrepreneurs who are engaged in new venture creation until they reach profitability or until they disengage, having never reached profitability. The data set includes entrepreneurs from four countries (Australia, China, Sweden, and United States) that represent different levels of uncertainty avoidance. We apply a Cox proportional hazard model to investigate how the time to disengagement from an unprofitable new venture is related to an increase in prediction- and control-focused behaviors. The findings show that greater engagement in predictive actions is associated with shorter time to disengagement from new venture creation; greater engagement in control actions is associated with longer time to disengagement from new venture creation. The former effect varies dependent on the uncertainty avoidance of the country in which a new venture is established: under higher levels of uncertainty avoidance control actions accelerate disengagement.

The results make contributions toward understanding disengagement from new ventures by investigating the roles of behavioral approaches and context in explaining the time to disengagement. First, we associate disengagement with the well-known strategic management constructs of prediction and control in the unexplored context of new venture

creation. To this end, we provide insights into how behaviors that focus on predicting the goal or controlling the means of new venture creation affect the time to disengagement. Only a handful of studies have tested prediction and control empirically (Mauer et al., 2018; Reymen et al., 2015; Wiltbank, Read, Dew, & Sarasvathy, 2009), and none has operationalized them behaviorally or tested them in relation to disengagement outcomes. However, such insights are valuable to entrepreneurs, who are currently trying to establish a new venture. Second, this study shows that the relationship between control-focused behaviors and time to disengagement depends on the level of uncertainty avoidance in the new venture's country. As such our study proposes potential contextual contingencies that should be taken into account when investigating the new venture creation process and its outcomes (Gartner & Shaver, 2012).

3.2 Conceptual background and hypotheses

3.2.1 Time to disengagement from new venture creation

Entrepreneurship scholars increasingly recognize the importance of disengagement in the new venture creation process (Khan, Tang, & Joshi, 2014; Yusuf, 2012). We define *disengagement* as withdrawing from and ceasing pursuit of a new venture before any profits are made from it (Khan et al., 2014; Toft-Kehler, Wennberg, & Kim, 2016). Our definition is aimed at distinguishing between individual-level disengagement from an unprofitable new venture, an outcome that occurs in the early stages of venture creation (DeTienne, 2010), and firm-level exit, which occurs in later stages of young or mature firms (Balcaen, Manigart, Buyze, & Ooghe, 2012; Balcaen et al., 2011; Yamakawa & Cardon, 2017). Locating disengagement in the pre-profit stage of venture creation, when entrepreneurs' active engagement does not generate them income, has important implications for the reasons, and the routes to disengagement (Wennberg, Wiklund, DeTienne, & Cardon, 2010). Thus, in the pre-profit stage we observe disengagement as a voluntary withdrawal from an unsuccessful venture creation attempt (Headd, 2003) for reasons similar to the motivational forces behind voluntary employee turnover, e.g., other opportunities, social norms and influences, feelings of comfort or discomfort, low chances of goal achievement (DeTienne, 2010; Maertz & Campion, 2004). In contrast, at firm stage the exit can have many different routes, varying from successful to unsuccessful (Headd, 2003), such as mergers and acquisitions, trade sales and IPOs (Cefis & Marsili, 2011; Giot & Schwiendbacher, 2007), bankruptcies and liquidations (Balcaen et al., 2012). Furthermore, unlike entrepreneurial exit which signifies the act of an entrepreneur leaving a firm, while the firm can still exist on the market in the case of a family succession for example (DeTienne, 2010; DeTienne, Mckelvie, & Chandler, 2015), disengagement signifies an outcome of entrepreneur leaving venture creation, thus the venture may never become a firm on the market.

Considering the voluntary nature of disengagement and the unprofitable stage of the new venture in the instance of disengagement, time becomes an important characteristic of disengagement which can determine the consequences of disengagement for the individual entrepreneur (Yamakawa & Cardon, 2017). Previous research has shown that the average amount of time that entrepreneurs put into unprofitable ventures from which they eventually disengage is higher than the average time they spend on ventures that lead to a profitable outcome (Hechavarría et al., 2016). Thus, it is even more important to investigate time as a characteristic of the outcome of disengagement and to understand what factors can decrease the time to disengagement.

The potential benefits to the entrepreneur of decreasing the time to disengagement from venture creation are numerous. First, according to psychology research, when people face situations in which they cannot realize key life goals – such as establishing profitable ventures – the most adaptive response for their mental and physical health is to disengage from the goal pursuit (Miller & Wrosch, 2007). The alternative, persisting for too long, endangers personal well-being (Carver & Scheier, 2005). Second, prolonged venturing can consume scarce resources. The shorter the time to disengagement the earlier those resources are freed to be invested in other personal goals (DeTienne, 2010; Wrosch et al., 2003), such as starting other ventures (Hayward et al., 2010). Over one's career trajectory, time is a scarce resource (Dew, Read, Sarasvathy, & Wiltbank, 2009), so knowing when to stop putting effort into ventures may increase overall career success (Burton, Sørensen, & Dobrev, 2016; Dimov, 2010). Third, disengagement can create learning opportunities (Cassar & Craig, 2009; Politis, 2005), because it spurs reflection on initial opportunities, such that entrepreneurs learn how to evaluate opportunities better in the future. Therefore, if an entrepreneur manages to achieve a shorter time to disengagement, he/she can improve the learning process. Overall, we argue that new venture entrepreneurs can benefit from disengaging from unprofitable ventures sooner rather than later (Ries, 2011).

The benefits of decreasing the time to disengagement suggest the need to identify factors that accelerate or delay the disengagement outcome. Entrepreneurs tend to delay their decisions to close poorly performing businesses, such that many underperforming firms persist for extended periods of time (Gimeno, Folta, Cooper, & Woo, 1997). Previous research has found that cognitive, emotional and motivational factors explain why entrepreneurs continue their venturing efforts despite lack of evidence for venture profitability (Cardon & Kirk, 2015; Van Gelderen, 2012). For example, persistence may be the result of cognitive influences such as mindsets and decision biases (McMullen & Kier, 2016; Yamakawa & Cardon, 2017). It also may be caused by emotions such as anticipatory grief or fear of failure (Kollmann et al., 2017; Shepherd, Wiklund, & Haynie, 2009). Furthermore, it can be explained by the entrepreneurs' motivational hub, consisting of beliefs about one's ability to create a new venture (Hechavarría, Renko, & Matthews, 2012). In this study we propose that the cognitive, emotional and motivational forces, which inform the time to disengagement, are affected by the behaviors of entrepreneurs. Accordingly, we expect

that different entrepreneurial actions will affect the time to disengagement differently, depending on whether their focus is prediction or control.

3.2.2 Prediction and control-focused actions of entrepreneurs

In order to create a new venture, entrepreneurs need to take actions (Frese, 2009). To determine how different types of actions affect the time to disengagement, we put forward strategic management constructs of prediction and control (Brinckmann et al., 2010; Kuechle et al., 2016; Mauer et al., 2018; Mintzberg & Waters, 1985; Sarasvathy, 2001; Wiltbank et al., 2006); and investigate the effects of prediction-focused actions and control-focused actions on the time to disengagement from new venture creation. Prediction and control are not antithetical, opposite ends of a continuum (Frese & Gielnik, 2014; Perry et al., 2012), entrepreneurs can engage in both types of actions simultaneously (Fisher, 2012; Reymen et al., 2015) and they can jointly lead to venture creation (Futterer, Schmidt, & Heidenreich, 2018; Villani, Linder, & Grimaldi, 2018).

The main differentiator of prediction and control actions is their focus on different aspects of the new venture creation process: ends versus means (Huang & Zhang, 2013). Predictive actions, such as gathering information to estimate the probability of new venture creation, focus on the end goal of the venture creation process; whereas control actions, such as involving stakeholders, employees and co-founders, focus on the means of the venture creation process. Prediction-focused behavior includes business planning, defining market opportunities, and asking for formal funding (Brinckmann et al., 2010). Control-focused behavior involves actions such as promoting and capturing opportunities and leveraging and acquiring resources (Mauer et al., 2018; Wiltbank et al., 2006, 2009). Both prediction and control can have positive influences on venture creation and performance (Delmar & Shane, 2003; Dew, Read, et al., 2009; Greene & Hopp, 2017; Gruber, 2007; Sarasvathy, 2001). We extend these findings by examining the effects of prediction-focused and control-focused actions on the time to disengagement from the new venture creation process.

3.2.3 Prediction-focused actions

Strategy scholars propose several key components of prediction-focused behavior (Andrews, 1971; Ansoff, 1965; Armstrong, 1982; Mintzberg & Waters, 1985), including the definition of clear and articulated goals, generation of alternatives to reach these goals, evaluation, and decisions among alternatives. Evaluation and decisions among alternatives require market research, forecasts, and detailed analysis (Wiltbank et al., 2006). In this study, we argue that engaging in prediction-focused actions entails cognitive, emotional and motivational influences over the time to take a disengagement decision. In the following paragraphs, we present arguments for the effect of increased engagement in prediction-focused actions on the time to disengagement.

First, greater undertaking of prediction-focused activities facilitates rapid decision making, including the decision to disengage, because it allows entrepreneurs to foresee and

overcome information inconsistencies (Delmar & Shane, 2004; Honig & Karlsson, 2004). As a rational-comprehensive and formal approach, prediction enables entrepreneurs to assess whether new ventures are viable (Carter et al., 1996; Davidsson, 2006). By answering the question of viability (Davidsson, 2006), the decision to continue or disengage does not need to be delayed. Systematic planning, which is typical of a prediction-focused approach, also helps entrepreneurs to reduce the effects of personal bias and subjectivity on decision making (Ansoff, 1965; Priem, Harrison, & Muir, 1995). Such bias often leads to delayed disengagement decisions and ‘throwing good money after bad’ (Yamakawa & Cardon, 2017).

Second, greater number of predictive actions prevents the experience of, and provide a remedy against, anticipatory emotions (Huang & Zhang, 2013; Kruglanski, Pierro, & Sheveland, 2011). When outcome probabilities are unknown, entrepreneurs may anticipate negative emotions associated with disengagement such as anticipatory regret or anticipatory fear of failure (Shepherd, 2003; Shepherd et al., 2009). Such anticipatory emotions may fuel a strong desire to persist in the new venture creation process. However, when outcome probabilities are known, entrepreneurs may not associate negative emotions with disengagement and no longer feel a strong desire to persist. By increased engagement in prediction-focused actions, entrepreneurs can construct emotional safety nets that dampen their desire for persistence and allow them to disengage sooner (Shin & Milkman, 2016).

Third, by increased engagement in prediction-focused actions, entrepreneurs divide the new venture creation process into specific micro-goals and time-bound milestones. This approach to goal setting is extremely useful for goal monitoring (Locke & Latham, 2002). By including time-relevant evaluation points in the preparation of blueprints or business plans, entrepreneurs can monitor the progress of their goal completion better. Monitoring goal completion provides valuable information that can feed back into evaluations of the feasibility and desirability of future courses of action (Doerflinger, Martiny-Huenger, & Gollwitzer, 2017; Gollwitzer & Sheeran, 2006). Thus, entrepreneurs return to the position of deliberating on their opportunity beliefs and allowing for termination if their beliefs are not met (Davidsson, 2006). For example, entrepreneurs who engage in prediction and monitor their progress likely can identify obstacles to product/service development, resource acquisition or market entry, thereby lowering their opportunity beliefs (Kollmann et al., 2017) and increasing the likelihood of disengagement. Therefore, engaging in more predictive actions can be beneficial for lowering the time to disengagement.

Fourth, by engaging in more prediction-focused actions, entrepreneurs gain information about the high failure rates (Dew, Read, et al., 2009) associated with new ventures (Mellahi & Wilkinson, 2004). By undertaking market research and financial projections (i.e., prediction-focused actions), they can quantify the probabilities of failure. The prospect of failure can reduce people’s motivation and confidence (Shaver, Gartner, & Gatewood, 2001). Inflated, overconfident expectations often lead entrepreneurs to over-allocate resources, such as time, to ventures that have little intrinsic chance of success (Hayward et

al., 2006). By engaging in more prediction-focused actions entrepreneurs are less likely to have inflated expectations of success, ultimately leading to shorter time to disengagement.

Overall, because undertaking more prediction-focused actions is associated with rapid decision making, reduced anticipatory emotions, increased goal-achievement monitoring and reduced motivation to persist, it will accelerate disengagement. Formally, we propose that:

H1: Increased entrepreneurial engagement in prediction-focused actions is positively associated with shorter time to disengagement from new venture creation.

3.2.4 Control-focused actions

Scholars have questioned the effectiveness of prediction-focused behavior, especially in uncertain and unpredictable environments, and in situations with unanticipated consequences (Jiang & Tornikoski, 2019). They propose that the new venture creation requires rapid initiation of actions to capture arising opportunities, thus creating alternative paths to proceed with venture creation (Mintzberg & Waters, 1985; Mosakowski, 1997). Control actions focus on obtaining means for new venture creation through a process in which ‘action often precedes clear goals and predicted outcomes’ (Wiltbank et al., 2006, p. 990). Two metaphors – ‘making do’ (Dew, Sarasathy, et al., 2009) and ‘storming the castle’ (Brinckmann et al., 2010) – describe control-focused behavior, indicating the proactive, creationist nature of control. Like prediction-focused actions, we suggest that an increase engagement in control-focused actions also influence the time to disengagement via cognitive, emotional and motivational forces. In the following paragraphs we present arguments for the effect of an increased engagement in control-focused actions on the time to disengagement.

First, because control actions are means-focused, the more control-focused actions entrepreneurs undertake, the more means and resources they leverage and acquire (Read, Song, & Smit, 2009; Wiltbank et al., 2006). In the new venture creation process, having available resources help mitigate risks and enable entrepreneurial persistence (Sharfman, Wolf, Chase, & Tansik, 1988; Tan & Peng, 2003) and growth (Bradley, Wiklund, & Shepherd, 2011). The safety cushion provided by available resources also may reduce entrepreneurial urgency and aspiration (Edelman & Yli-Renko, 2010), resulting in a slower pace of venturing and a longer time to disengagement. Generally, entrepreneurs persist at least until their buffers of accumulated resources are depleted (Gimeno et al., 1997). Accordingly, we expect that increased engagement in control-focused actions – that is, enabling accumulation of resources – increases entrepreneurs’ risk propensity (Keil et al., 2000) and delays disengagement.

Second, engaging in more control-focused actions also may bias decision making against disengagement, because it promotes heuristic decision making. Control through resource leveraging can evoke feelings of responsibility for resource investment decisions

(Staw, 1976) and have psychological effects related to sunk costs (Arkes & Blumer, 1985), loss aversion (Whyte, 1993), project completion tendencies (Moon, 2001), and over-optimism (Åstebro, Jeffrey, & Adomdza, 2007). Entrepreneurs who increasingly adopt control-focused behavior by investing their own time and money in venture creation are more likely to continue with ventures to avoid appearing wasteful (Arkes & Blumer, 1985). Furthermore, their feelings of responsibility for their initial decisions to pursue venture creation increase their likelihood of continuing their ventures even in the face of negative feedback and evidence supporting the need for disengagement (McMullen & Kier, 2016). These powerful factors will increase the time entrepreneurs persist with the unprofitable venture and thus, increase the time to disengagement.

Third, undertaking more control-focused actions and gaining more control over the future is positively related to experience of positive emotion (Watson, Wiese, Vaidya, & Tellegen, 1999). In turn, positive emotion, such as passion for example, promotes flexibility and adaptation according to the situation at hand (Aspinwall, 2005), enables creativity (Baron & Tang, 2011) and a wider scope of attention (Hayton & Cholakova, 2012) and relates to persistence in the face of adversities (Cardon et al., 2009; Cardon & Kirk, 2015). Therefore, during the uncertain process of new venture creation, entrepreneurs who experience positive emotion are more likely to try adapt to the unprofitable circumstances by expanding or innovating the scope of their current opportunity and thus, persisting with the venture creation. In conclusion, increase in control-focused actions brings about positive emotions, which can also delay the disengagement decision, therefore, increasing the time to disengagement.

Fourth, greater control behavior shifts the motivation focus on the means rather than the goals of the new venture creation process. Goals are the products, not the precursors, of actions (Sarasvathy, 2001). Therefore, the more control-focused actions entrepreneurs engage in, the more opportunities they leverage, thus creating alternative paths to proceed with the venture creation. Because goals are not predetermined (March, 1978), engaging in more control-focused actions is more likely to result in the generation of new goals through proactive (re)-organization of means (Sarasvathy, Menon, & Kuechle, 2013). Nevertheless, because entrepreneurs explore various means–ends relationships, they remain in the new venture creation process for longer time, ultimately leading to increase in the time to disengagement.

Overall we argue that undertaking more control-focused actions is associated with higher risk propensity, heuristic decision making, increased positive emotions and greater number of goal alternatives; thus, it will delay disengagement. Formally, we propose that:

H2: Increased entrepreneurial engagement in control-focused actions is negatively associated with shorter time to disengagement from new venture creation.

3.2.5 Prediction and control-focused actions and time to disengagement across countries

Entrepreneurs' behavior can lead to different outcomes depending on the context in which the new venture is being created (Schneider & De Meyer, 1991). An important difference between countries, widely investigated in empirical studies (e.g., Brinckmann et al., 2010; Dickson, Weaver, & Hoy, 2006; Saeed, Yousafzai, & Engelen, 2014; Wennekers, Thurik, Van Stel, & Noorderhaven, 2007), is tolerance of uncertainty (Hofstede, 1984, 2001). People in different countries perceive ambiguous and unknown situations differently depending on their country's level of uncertainty avoidance. In countries characterized by high levels of uncertainty avoidance, such as China, people tend to be more threatened by uncertain situations; they prefer structures, regulations, and expert knowledge to reduce their perceived uncertainty (Brinckmann et al., 2010; Keil et al., 2000). Conversely, in countries characterized by low levels of uncertainty avoidance, such as Sweden, people tend to be comfortable with uncertain situations and unfamiliar risks and do not demand much documentary evidence before making decisions (Keil et al., 2000; Shane, 1995). Accordingly, considering the uncertainty of the new venture creation process (Dickson et al., 2006), the dimension of uncertainty avoidance is particularly relevant to our study; it provides contextualized insights into the relationship between prediction-focused and control-focused actions and time to disengagement.

In countries with low uncertainty avoidance, entrepreneurs may be more willing to bear the uncertainty associated with contradicting information and tolerate the unforeseen changes typical of new venture creation (Brinckmann et al., 2010). In such contexts, the likely responses to uncertainty are alertness, flexibility and improvisation (Baker, Miner, & Eesley, 2003), which predict persistence and performance (Cottrell & Nault, 2004). The more tolerant of uncertainty the entrepreneur is, the more likely he/she is to remain in the new venture creation process and postpone disengagement. Despite undertaking more prediction-focused actions, entrepreneurs from low uncertainty avoidant countries will be more likely to persist with their ventures for longer time. Therefore, we expect that in countries with low (high) uncertainty avoidance, increased engagement in prediction-focused actions will have weaker (stronger) associations with time to disengagement. Thus, we propose:

H3a: Uncertainty avoidance moderates the association of prediction-focused actions and time to disengagement from new venture creation: The higher the uncertainty avoidance, the more likely it is that increase in prediction-focused actions positively associates with shorter time to disengagement.

In countries with high uncertainty avoidance, we expect entrepreneurs to be less likely to delay their disengagement from an unprofitable venture even if they take more control-focused actions. In these countries, entrepreneurs have lower tolerance for risk

over time (Keil, et al. 2000); those who increasingly engage in control-focused actions and are confronted with high levels of sunk costs may not be very risk-prone. They prefer to minimize their losses and disengage sooner rather than endure the uncertainty of persisting in resource-demanding, control-focused actions. Accordingly, high uncertainty avoidance may mitigate the relationship between control-focused actions and time to disengagement. We propose that:

H3b: Uncertainty avoidance moderates the association of control-focused actions and time to disengagement from new venture creation: The higher the uncertainty avoidance, the less likely it is that increase in control-focused actions negatively associates with shorter time to disengagement.

3.3 Data and methodology

3.3.1 Sample

Various projects have examined potential outcomes of new venture creation (Carter et al., 1996; Reynolds, Carter, Gartner, & Greene, 2004). Among these, the Panel Study of Entrepreneurial Dynamics (PSED) is unique in examining entrepreneurs' actions during the new venture creation process by drawing on large, national random samples (Reynolds & Curtin, 2011). Since 1993, there have been several national PSED studies. Five of them used similar procedures to identify the occurrence and time of actions performed during the new venture creation process and determining the outcomes of the process. The data set that we use in this study represents a harmonization of data from Australia (CAUSEE), China (CH-PSED), Sweden (SE-PSED), and the United States (PSED I and PSED II).

Each of the five studies began by screening a random sample of representative adults to identify those currently involved in new venture creation processes. For the Australian, Swedish, and two USA cohorts, the samples are representative of the entire country, whereas the Chinese sample is drawn from eight cities, selected at random to represent four major regions of the country. The harmonized PSED data set provides a consolidated, standardized timeline for all entrepreneurs, reporting the time of the actions they have undertaken and the dates of their disengagement (if disengaged) (Gartner & Shaver, 2012). This harmonized PSED is one of the only publicly available data sets that provides data on the time it takes entrepreneurs to disengage from new ventures.

The harmonized PSED sample included 3,910 participants. In line with the PSED data collection procedure, previous literature (Davidsson & Gordon, 2012; Hechavarría et al., 2016), and our conceptualization of disengagement, we considered *persistence* – that is, continuation of venturing – to be the main alternative to disengagement. Some entrepreneurs leave the study when they *reach profitability* (i.e., the entrepreneur achieves monthly profits to cover expenses and salaries; Reynolds, 2016b); that is, they do not

disengage from an unprofitable new venture. Therefore, we removed all participants who exited the study by reporting they had achieved profitability ($N = 1,064$). In addition, we followed recommended data cleaning steps (Reynolds, 2016a) (see Appendix 2.1 for details), which left a remaining sample of 1,748 entrepreneurs.

3.3.2 Dependent variable

We derived our measurement of time to disengagement from two parts of the PSED study: an outcome indicator and a measure of time from conception of a venturing effort to disengagement. Among the five cohorts, disengagement has been indicated as a self-report by the focal respondent. The USA PSED I and CAUSEE cohorts identify disengagement based on entrepreneurs' self-reports that they and any potential co-founders have stopped working on the venture. The CH-PSED, SE-PSED and USA PSED II cohorts identify disengagement based on entrepreneurs' self-reports that they have stopped working on their ventures, however, their co-founders might be still working on the venture. Of the USA PSED II participants who disengaged, only 8 percent reported that other people were still working on their new ventures (Yang & del Carmen Triana, 2017). Furthermore, when asked why others are still working on the venture, the two most popular reasons given by respondents are because: 'they enjoy the work/ want to do it' and 'they are holding out/ not ready to give up'.

We measured time to disengagement in months, from the conception date, i.e., the date of the first of two actions, undertaken by the entrepreneur within a 12-month period (Reynolds & Curtin, 2011), until disengagement was reported or the data point was censored. We computed all data according to the harmonized transitions file on the PSED website for all five cohorts (PSED I; PSED II: SE-PSED; CH-PSED; CAUSEE). The variable CPT_MY provides the conception date of the venture, and SU_QUIT and SU_ACTIV provide indicators of the outcome and its date (disengagement vs. persistence) for each participant in the PSED data set (Reynolds, 2016).

All participants in our dataset, across the five PSED cohorts and across the two outcomes of disengagement and persistence, have never received salaries from the venture that they have worked on. This is in line with our definition of disengagement as withdrawing from a venture before any profits have been made.

3.3.3 Independent variables

The PSED studies do not measure directly the constructs of prediction and control. To create measurements that reflect the definitions of prediction-focused and control-focused actions, we followed an established procedure (Brush et al., 2008; Chen, Mitchell, Brigham, Howell, & Steinbauer, 2018). First, we identified all actions performed during new venture creation process (Mueller et al., 2012) and recorded by the PSED studies. Second, we assessed the actions according to a set of criteria grounded in psychology literature. According to this criteria, actions are: (i) things that people do as opposed to things that

happen to them or things that their brains do (Greve, 2001); (ii) chosen to be performed for a reason and under the performer's control (Winch, 1958, 2002); and (iii) can be observed by others and "sized" as meaningful to both actor and audience (Bird, Schjoedt, & Baum, 2012). By considering this set of criteria and merging five cohorts of data collection, we identified 16 actions that could be harmonized among the five cohorts.

To determine which actions relate most to the prediction versus control concepts, we performed an out-of-sample pre-test. Appendix 2.2 reports the details and results. According to the pre-test results and the substantive validity coefficients we obtained (Anderson & Gerbing, 1991), we selected five actions that collectively measured prediction-focused actions and five that collectively measured control-focused actions. The measure of prediction-focused actions is a formative index (Samuelsson & Davidsson, 2009), which we computed as the sum of the number of undertaken actions that according to the pre-test, best represented our definition of prediction. These actions included business planning, defining markets to enter, creating financial projections, asking for formal funding, and filing for patent or copyright. We also developed the measure of control-focused actions as a formative index (Samuelsson & Davidsson, 2009), which we computed as the sum of the number of actions performed by the entrepreneur that according to the pre-test, best represented our definition of control. This measurement included investment of own money, working full-time (35+ hours a week) on the start-up, organizing the start-up team, development of model or prototype, and hiring an employee.

3.3.4 Uncertainty avoidance

We used the uncertainty avoidance values from the GLOBE project (House, Hanges, Javidan, Dorfman, & Gupta, 2004) to evaluate how context moderates the relationship between prediction- and control-focused actions and time to disengagement. The GLOBE project is a cross-country study that examines cultural differences across 62 societies; it replicates Hofstede's study (Hofstede & Bond, 1988; Hofstede, 2001). We chose the GLOBE study instead of the original values from Hofstede's IBM study, because Hofstede's values were developed in the 1970s and may no longer be representative of the constructs they intended to measure. Using the country information of each sample, we assigned a respective uncertainty avoidance value. Thus, we gave participants country-specific scores: United States (4.00), Sweden (3.60), Australia (3.98), and China (5.28) (scale from 1 to 7). This approach is appropriate, because our comparison focused on relative differences between countries rather than absolute levels of uncertainty avoidance (Brinckmann et al., 2010).

3.3.5 Control variables

We designated *Industry* as a control variable because of potential differences in actions required in different industries. An industry's turbulence, entry/exit barriers, and competitive landscape have impacts on the outcomes of new venture creation (Brannon,

Wiklund, & Haynie, 2013), so we controlled for industry by creating dummy variables for (1) extractive, (2) transforming, (3) business-service supplying, and (4) consumer-oriented industries (Hechavarría et al., 2016).

Sales of products and services can have an important influence on the outcomes of new venture creation processes (Hechavarría et al., 2016). As positive performance indicators (Newbert & Tornikoski, 2012), they may have an adverse effect on disengagement. Nevertheless, achieving sales does not in itself indicate that the venture is profitable, because some entrepreneurs make their first sales even before recognizing entrepreneurial opportunities (Davidsson, 2006). Therefore, we also included a binary variable to indicate whether the entrepreneur had received any income from sales of products or services (SALES_AW).

The team size indicator has been used as a proxy for resources available to new ventures (Wezel, Cattani, & Pennings, 2006). Research shows that team size has a negative effect on disengagement (Carroll & Hannan, 2000). Therefore, we included team size (TM_SIZEH) as a control variable in our models to capture the potential impact of number of team members.

Although growth-oriented ventures require more resources than non-growth ventures, both to start and expand (Gartner & Liao, 2012), entrepreneurs who aspire to create growth-ventures likely adopt different actions than those who have more modest aspirations. Therefore, we controlled for the entrepreneur's growth aspirations (GR_PREF), with values of 1 for maximum growth aspirations and 0 for easy to manage size aspirations.

According to Davidsson & Gordon (2016), initiation of a technology-based venture indicates a high level of entrepreneurial ambition. Highly ambitious entrepreneurs are more likely to become disappointed and thus more likely to disengage (Khelil, 2016). We included the high-tech variable in our model as a dichotomous variable, coded 1 for affirmations of "Would you consider this business to be hi-tech?" and 0 otherwise (HI_TECHQ).

Human capital can affect the time it takes to reach any outcome in the new venture creation process (Gimeno et al., 1997), so as an important control variable, we included education as a dichotomous variable indicating whether the founding entrepreneur had a university degree (1) or not (0) (TM1_EDUC).

Older entrepreneurs also are more likely to reach positive outcomes faster (Brockhaus & Horwitz, 1986), such that age may negatively affect the time to disengagement. We followed Hechavarría et al. (2016) and used a series of five binary variables to control for the age of the entrepreneur (18–24, 25–34, 35–44, 45–54, 55–99) (TM1_AGE). Finally, we controlled for the entrepreneur's gender, coded as 1 for men and 0 for women (TM1_SEX).

3.3.6 Analytical procedure

We analyzed the time to disengagement from venture creation using an event history analysis that takes into account both the occurrence and the time to the event, i.e., disengagement. By modeling the hazard rate, the event history analysis estimates the

likelihood that disengagement is observed at a time t , given that disengagement has not occurred prior to time t . Using the hazard function allows us to calculate directly the time to disengagement. In particular, an increase in the hazard function can be interpreted as a decrease in the time to disengagement. To test our model and hypotheses, we employed a particular event history analysis, i.e., the Cox model (Cox, 1972). The Cox proportional hazard model is a widely used, semi-parametric, flexible model (Box-Steffensmeier & Jones, 2004) that easily incorporates time-varying variables (Hosmer, Lemeshow, & May, 2008), handles left-truncated and right-censored data (Guo, 1993), and it has been previously used to study time to outcomes in the new venture creation process (Hechavarría et al., 2016; Wennberg et al., 2016).

In the harmonized PSED, entrepreneurs have been exposed to the risk of disengaging from their ventures before they enter the study. Thus, the sample features delayed entry and is characterized by left truncation (Yang & Aldrich, 2012). Failure to control for this left truncation would mean not only that the magnitude of the explanatory variables' effects would be biased, but also that the significance of the effects would be mistakenly estimated (Yang & Aldrich, 2012). Therefore, we followed the recommended approach for handling data with delayed entry (Cleves, 2008), such that the entry in the study occurred after $t = 0$, or the time when the risk of disengagement began. In declaring the data for Cox model, with the `stset` command in STATA 14, we specified entry as the time at which the entrepreneur had been screened in the study. If at the time of this screening a respondent had already disengaged from his or her venture, he or she would have not qualified to participate. Thus, the screen date specification allowed us to set dates when participants entered the risk pool.

Another stipulation of our model is that it includes time-varying predictors (Singer & Willett, 2003). Such time-varying covariates are common in event history models used in entrepreneurship literature. To account for the time-varying nature of our independent variable (i.e., over time the number of actions taken by entrepreneurs increases), we transformed the data into multiple records per person. We followed Katila & Shane's (2005) approach to construct relevant annual spells of the process to accommodate for time-varying covariates, such that we split the data over outcome times by year (1st year, 2nd year, ..., 6th year and beyond) until disengagement or censoring took place. We based this data split on the time increments proposed by Reynolds (2016a). At different stages, entrepreneurs engage in different numbers and combinations of actions; therefore, we added each newly performed action to its respective independent variable measure in the period when it occurred. Similarly, we modified any control variables that change with time, such as the occurrence of sales, to account for their time-varying structure. For example, if an entrepreneur achieved a sale (i.e., control variable sales) in the fourth year of the process and also decided to disengage from the venture in the fifth year, the observations of the control variable sales would be: 0, 0, 0, 1, 1. Such partitioning made the entire span of time inherent to the observation. Everything that happened in between was an embedded part of the explanation of the outcome that eventually emerged.

The harmonized PSED data set includes survey weights, such that calculated statistics are representative of the specific populations. These weights account for differences in selection probabilities and response rates (Reynolds & Curtin, 2008). Our Cox proportional hazard models included these weights. Finally, to minimize the effects of heterogeneity on our results, we used robust estimators to obtain consistent standard errors, as suggested by Davidsson (2006) and Hechavarría et al. (2016).

3.4 Results

3.4.1 Descriptive statistics

Table 3.1, which provides the means, standard deviations, and correlations for all variables used in our analyses, suggests there are no critically collinear variables in our data (e.g., $r > 0.8$ according to Kennedy, 2003). Using ordinary least squares (OLS) regression with number of months to disengagement as the dependent variable, we calculated variance inflation factors (VIFs) for all independent variables in our analyses. Most of the VIFs were within the 1.04 to 1.99 range, but the industry variables had higher VIFs (consumer industry, 4.35; transformation industry, 3.61, extractive industry, 2.37). However, these values were still below the most commonly recommended threshold of 10 (Hair et al., 2006), so there was no major multicollinearity problem in our data.

3.4.2 Cox proportional hazards models

To complete the Cox proportional hazards model, we used the *stset* command in STATA 14 to set up the analyses, with a yearly interval counter of the number of months as the time variable, disengagement as the hazard variable, unique case ID (*co_respid*) as the panel identifier, date of screening into the study (*screen_date*) as the entry date, and sampling weights (*wt_vn_gd_ne*). We used the *stcox* command to run the models, creating three models to test our hypotheses. The first was the base model, containing only the control variables. The second model tested Hypothesis 1 and 2 by adding the independent variables – prediction and control-focused actions – to the base model. Model 3 included the interaction terms between the independent variables and the moderator. Interaction effects were mean-centered for inclusion and analysis.

Testing the proportional hazard assumption. The Cox model relies on the proportional hazards (PH) assumption, implying that the covariates of interest have a constant impact on the hazard rates over time. To test whether the effects of the covariates meet this assumption, the Kaplan-Meier survival distribution can be plotted, with $S(t)$ as a function of the survival time for each level of the covariate (Bellera et al., 2010). However, when the covariate has more than two levels (i.e., in this data set, prediction and control have values ranging from 0 to 5), Kaplan-Meier plots (as well as log-minus-log curves and Schoenfeld residual plots)

Table 3.1 Means (M), Standard Deviations (SD) and Pearson Correlations of Study Variables

| Variable | M | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------------|-------|-------|---------|---------|---------|---------|--------|---------|---------|---------|---------|---------|
| (1)Age 18 to 24 | 0.08 | 0.28 | 1.00 | | | | | | | | | |
| (2)Age 25 to 34 | 0.25 | 0.43 | -0.18** | 1.00 | | | | | | | | |
| (3)Age 35 to 44 | 0.27 | 0.44 | -0.18** | -0.35** | 1.00 | | | | | | | |
| (4)Age 45 to 54 | 0.24 | 0.43 | -0.17** | -0.33** | -0.34** | 1.00 | | | | | | |
| (5)Age 55 and above | 0.16 | 0.36 | -0.13** | -0.25** | -0.24** | -0.24** | 1.00 | | | | | |
| (6)Gender (male) | 0.59 | 0.49 | 0.06* | 0.04 | -0.06* | -0.04 | 0.04 | 1.00 | | | | |
| (7)Education (graduate) | 0.16 | 0.37 | -0.12** | -0.09** | 0.01 | 0.04 | 0.14** | 0.02 | 1.00 | | | |
| (8)Team size | 1.70 | 0.94 | 0.05 | 0.03 | -0.3 | -0.04 | 0.00 | 0.11** | 0.05 | 1.00 | | |
| (9)High-tech | 0.29 | 0.46 | 0.05 | 0.01 | -0.01 | 0.01 | -0.03 | 0.11** | -0.01 | 0.05* | 1.00 | |
| (10)Growth aspiration | 0.27 | 0.44 | .010** | 0.07** | -0.01 | -0.10** | -0.04 | 0.08** | -0.01 | 0.10** | 0.18** | 1.00 |
| (11)Extractive industry | 0.12 | 0.32 | -0.07** | -0.06* | 0.02 | 0.02 | 0.07** | 0.05* | -0.01 | 0.01 | -0.01 | -0.03 |
| (12)Business service industry | 0.11 | 0.31 | 0.03 | 0.03 | -0.03 | -0.04 | 0.02 | 0.09** | 0.02 | 0.03 | 0.15** | 0.00 |
| (13)Transforming industry | 0.35 | 0.48 | 0.03 | -0.01 | 0.01 | 0.01 | -0.03 | -0.01 | -0.08** | -0.01 | -0.02 | 0.05* |
| (14)Consumer industry | 0.43 | 0.50 | 0.02 | 0.04 | -0.01 | -0.01 | -0.05 | -0.06* | 0.05* | -0.02 | 0.01 | -0.02 |
| (15)Sales | 0.57 | 0.49 | -0.07** | -0.05* | 0.04 | 0.01 | 0.06* | -0.10** | 0.04 | -0.07** | -0.04 | -0.09** |
| (16)Uncertainty avoidance | 4.05 | 0.40 | 0.21** | 0.07** | -0.09** | -0.07** | -0.04 | 0.02 | -0.12** | 0.02 | 0.06* | 0.25** |
| (17)Prediction-focused actions | 2.65 | 1.15 | 0.02 | 0.10 | 0.02 | -0.02 | -0.03 | 0.07** | 0.06** | 0.18** | 0.11** | 0.19** |
| (18)Control-focused actions | 2.55 | 1.09 | 0.05* | -0.01 | 0.05* | -0.06** | -0.01 | 0.02 | 0.03 | 0.20** | 0.05 | 0.06** |
| (19)Disengagement | 0.49 | 0.50 | 0.10** | -0.01 | -0.02 | 0.01 | -0.05* | 0.00 | -0.08** | 0.02 | -0.07** | 0.00 |
| (20)Time | 44.81 | 31.24 | -0.13** | -0.08** | 0.04 | 0.03 | 0.11** | 0.00 | 0.08** | -0.01 | 0.01 | -0.03 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed.

Table 3.1 Continues

| | <i>M</i> | <i>SD</i> | <i>I1</i> | <i>I2</i> | <i>I3</i> | <i>I4</i> | <i>I5</i> | <i>I6</i> | <i>I7</i> | <i>I8</i> | <i>I9</i> |
|--------------------------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 4.939 <i>mm</i> | | | | | | | | | | | |
| (1)Age 18 to 24 | 0.08 | 0.28 | | | | | | | | | |
| (2)Age 25 to 34 | 0.25 | 0.43 | | | | | | | | | |
| (3) Age 35 to 44 | 0.27 | 0.44 | | | | | | | | | |
| (4)Age 45 to 54 | 0.24 | 0.43 | | | | | | | | | |
| (5)Age 55 and above | 0.16 | 0.36 | | | | | | | | | |
| (6)Gender (male) | 0.59 | 0.49 | | | | | | | | | |
| (7)Education (graduate) | 0.16 | 0.37 | | | | | | | | | |
| (8)Team size | 1.70 | 0.94 | | | | | | | | | |
| (9)High-tech | 0.29 | 0.46 | | | | | | | | | |
| (10)Growth aspiration | 0.27 | 0.44 | | | | | | | | | |
| (11)Extractive industry | 0.12 | 0.32 | 1.00 | | | | | | | | |
| (12)Business service industry | 0.11 | 0.31 | -0.12** | 1.00 | | | | | | | |
| (13)Transforming industry | 0.35 | 0.48 | -0.27** | 0.07** | 1.00 | | | | | | |
| (14)Consumer industry | 0.43 | 0.50 | -0.31** | -0.30** | -0.62** | 1.00 | | | | | |
| (15)Sales | 0.57 | 0.49 | 0.01 | 0.00 | 0.00 | 0.02 | 1.00 | | | | |
| (16)Uncertainty avoidance | 4.05 | 0.40 | -0.02 | -0.06** | 0.06** | -0.03 | -0.21** | 1.00 | | | |
| (17)Prediction-focused actions | 2.65 | 1.15 | 0.02 | 0.07** | -0.03 | 0.02 | 0.01 | 0.04 | 1.00 | | |
| (18)Control-focused actions | 2.55 | 1.09 | 0.03 | 0.00 | -0.07** | 0.06* | 0.20** | 0.06* | 0.28** | 1.00 | |
| (19)Disengagement | 0.49 | 0.50 | -0.02 | 0.00 | 0.08** | -0.05* | -0.22** | 0.08** | -0.08** | -0.21** | 1.00 |
| (20)Time | 44.81 | 31.24 | 0.06** | 0.02 | -0.07** | 0.01 | 0.31** | -0.18** | 0.11** | 0.19** | -0.57** |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed.

are not useful for discerning non-proportionality, because the graphs become too cluttered (Therneau & Grambsch, 2013). Thus, we performed a post-estimation *estat phtest*, which checks the proportional hazards assumption by using Schoenfeld residuals after fitting the model with *stcox*. The results show that the proportional hazard assumption holds in all three models.

Table 3.2 presents the results of the Cox proportional hazard models with time-varying covariates (i.e., prediction and control). For this analysis, 889 cases report disengagement, and 859 are censored. The total sample size for the analysis is 1,748 subjects with 5,275 observations. The last recorded disengagement outcome is at the 175th month ($t = 175.41$). All coefficients represent hazard ratios, which are probability coefficients, indicating the effects of covariates. A hazard ratio larger than 1 means a variable has positive effects on time to disengagement and as such it decreases the time, whereas a hazard ratio smaller than 1 indicates a variable has negative effects on time to disengagement and as such it increases the time. For dummy covariates, the hazard ratio is the ratio of the estimated time to disengagement for entrepreneurs with a value of 1, compared with the time to disengagement for entrepreneurs equal to 0 (Yang & Aldrich, 2012).

In Hypothesis 1, we predicted that increased entrepreneurial engagement in prediction-focused actions would be positively associated with shorter time to disengagement from a new venture. In model 2 we find support for our hypothesis as engaging in more prediction-focused actions leads to a significant increase in the hazard rate of disengaging ($SHR = 1.15$, $p < 0.001$). Thus, an increase of one standard deviation on our measurement of prediction-focused action signifies a 15 percent increase in likelihood of disengagement across the sample period. In hypothesis 2 we predicted that greater engagement in control-focused actions would be negatively associated with shorter time to disengagement from a new venture. We also find support for hypothesis 2 as model 2 shows that increased engagement in control-focused actions ($SHR = 0.91$ $p < 0.05$) significantly decreases the hazard of disengagement. Increasing engagement in control-focused actions by one standard deviation leads to a 9 percent lower likelihood of disengagement across the sample period. The Wald test shows that the hypothesis of all coefficients being equal to 0 is rejected ($\chi^2(16) = 76.13$, $p < 0.001$). The results from the main effects model signify support for H1 and H2.

Furthermore we proposed two moderation hypotheses (H3a and H3b). In Model 3 we include the interaction effects of uncertainty avoidance and prediction- and control-focused actions for Cox proportional hazard estimation of time to disengagement. The interaction term for control-focused actions and uncertainty avoidance ($SHR = 1.26$, $p < 0.05$) increases the hazard rate of disengagement. Accordingly, we can conclude that entrepreneurs' increased engagement in control-focused actions in the condition of high uncertainty avoidance leads to 26 percent increase in the hazard rate of disengagement. To further illustrate the significant interaction term, we have graphed the interactions in Figure 3.1. The vertical axis in Figure 3.1 represents the hazard rate of disengagement. All study variables, except control-focused actions and uncertainty avoidance, were constrained

Table 3.2 Cox Proportional Hazard Models for Disengagement

| Variables | Controls | | | Main Effects | | | Interaction Effects | | |
|---------------------------------|------------|-----------|----------|--------------|-----------|----------|---------------------|-----------|----------|
| | <i>SHR</i> | <i>SE</i> | <i>P</i> | <i>SHR</i> | <i>SE</i> | <i>P</i> | <i>SHR</i> | <i>SE</i> | <i>P</i> |
| Age 25 to 34 | 1.00 | 0.07 | 0.97 | 0.98 | 0.07 | 0.81 | 0.98 | 0.07 | 0.77 |
| Age 35 to 44 | 1.00 | 0.07 | 0.98 | 1.01 | 0.07 | 0.89 | 1.01 | 0.07 | 0.88 |
| Age 45 to 54 | 1.09 | 0.08 | 0.20 | 1.10 | 0.08 | 0.16 | 1.11 | 0.08 | 0.12 |
| Age 55 and above | 0.92 | 0.08 | 0.34 | 0.92 | 0.08 | 0.33 | 0.91 | 0.08 | 0.29 |
| Gender (male) | 0.97 | 0.08 | 0.68 | 0.96 | 0.08 | 0.62 | 0.96 | 0.08 | 0.65 |
| Education (graduate) | 0.71** | 0.09 | 0.01 | 0.72** | 0.10 | 0.01 | 0.72** | 0.10 | 0.01 |
| Team size | 0.95 | 0.04 | 0.25 | 0.95 | 0.05 | 0.26 | 0.94 | 0.05 | 0.18 |
| High-tech | 0.93 | 0.08 | 0.39 | 0.93 | 0.08 | 0.39 | 0.93 | 0.08 | 0.41 |
| Growth aspiration | 1.04 | 0.04 | 0.22 | 1.02 | 0.04 | 0.60 | 1.02 | 0.04 | 0.63 |
| Extractive industry | 0.99 | 0.14 | 0.95 | 0.97 | 0.14 | 0.85 | 0.97 | 0.14 | 0.82 |
| Business service industry | 0.98 | 0.14 | 0.89 | 0.98 | 0.13 | 0.89 | 0.99 | 0.13 | 0.93 |
| Transforming industry | 1.25** | 0.11 | 0.01 | 1.25** | 0.11 | 0.01 | 1.25** | 0.11 | 0.01 |
| Sales | 0.65*** | 0.05 | 0.00 | 0.67*** | 0.06 | 0.00 | 0.68*** | 0.06 | 0.00 |
| Uncertainty avoidance | | | | 1.26* | 0.14 | 0.04 | 1.17 | 0.32 | 0.56 |
| Prediction-focused actions | | | | 1.15*** | 0.04 | 0.00 | 2.21* | 0.82 | 0.03 |
| Control-focused actions | | | | 0.91** | 0.04 | 0.01 | 0.34** | 0.11 | 0.01 |
| UA x Prediction-focused actions | | | | | | | 0.85 | 0.08 | 0.08 |
| UA x Control-focused actions | | | | | | | 1.26* | 0.09 | 0.02 |
| Wald χ^2 | 57.35*** | | | 76.73*** | | | 91.96*** | | |
| Schoenfeld residuals | 0.16 | | | 0.10 | | | 0.06 | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

to their mean values (Aiken, West, & Reno, 1991). Specifically, Figure 3.1 shows that an increased engagement in control-focused actions leads to an increase in the hazard of disengagement if the level of uncertainty avoidance is high. To investigate the interaction effect further we performed a marginal effects test. The test results confirm that the effect of increased engagement in control-focused actions on the disengagement hazard is positive only under the highest level of uncertainty avoidance. However, the individual marginal effects are not significantly different from zero (all p values are between 0.3 and 0.4). Since our comparison focuses on relative differences between countries rather than absolute levels of uncertainty avoidance, we only interpret the overall interaction effect and discuss the insignificant marginal effects in section Limitations and directions for future research. Finally, the interaction term for prediction-focused actions and uncertainty avoidance is non-significant ($SHR = 0.85$, $p = 0.08$); we cannot offer meaningful conclusions. These results support H3b, but not H3a.

3.4.3 Robustness checks

We conducted several tests to determine the robustness of our results. The Cox regression may be sensitive to tied events, so we tested our models using Weibull, lognormal, exponential, gamma, and logit distributions, all of which produced results similar to the reported Cox model when predicting disengagement.

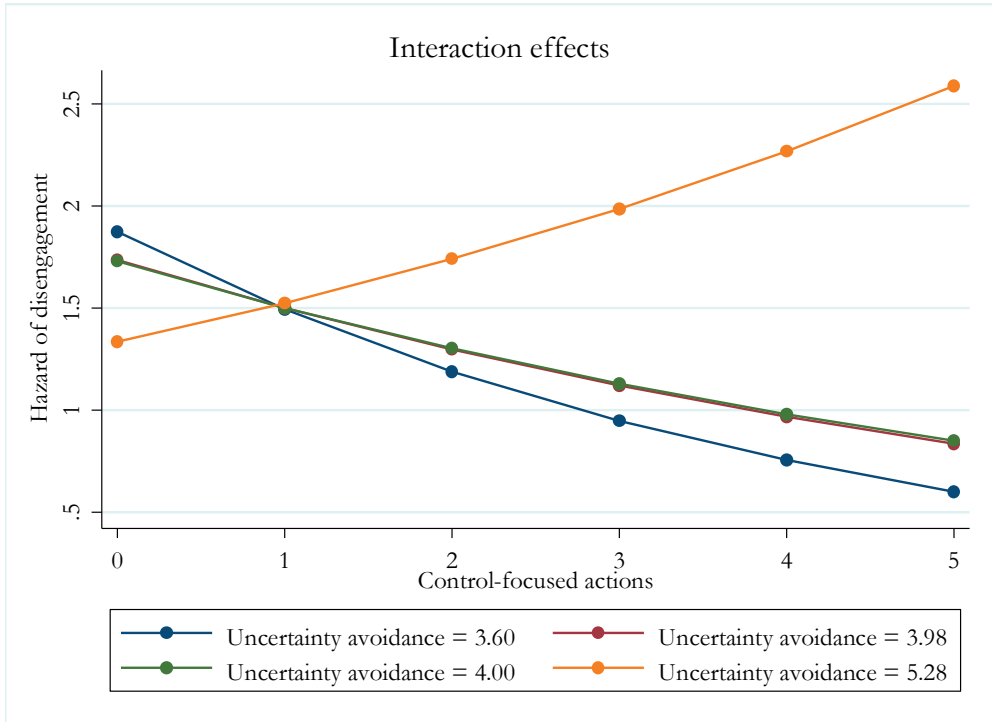


Figure 3.1 The Moderating Effect of Uncertainty Avoidance on the Relationship between Control-focused Actions and Time to Disengagement

Another potential problem is the potential presence of correlated explanatory variables of prediction and control ($r = 0.28, p < 0.01$). Multicollinearity makes parameter estimates unreliable and inflates standard errors (Van den Poel & Larivière, 2004). Therefore, we added the variables sequentially to the main models to assess the stability of the parameters and ensure that multicollinearity had no biasing impact on the results (Van den Poel & Larivière, 2004). We then estimated new models, to which we introduced prediction and control separately. The results revealed that the coefficients and significance of the main independent variables and the interaction terms remained highly stable in all models. Therefore, it is unlikely that the results were affected by multicollinearity.

Finally, we performed a formal test for the presence of omitted variables by running separate OLS regression with time to disengagement as the dependent variable and employing the post-estimation commands `estat ovtest` and `linktest` in STATA (Cameron & Trivedi, 2010). In all cases, we failed to reject the null hypothesis that the model has no omitted variables.

3.5 Discussion and implications

We set out to investigate the impact of prediction-focused and control-focused actions on the time to disengagement from venture creation. Overall, our results show that engaging in more prediction-focused actions leads entrepreneurs to disengage sooner from new ventures, and engaging in more control-focused actions leads entrepreneurs to persist longer. However, in countries with high uncertainty avoidance, the effect of control-focused actions is mitigated; increased engagement in control-focused actions leads to shorter time to disengagement under conditions of high uncertainty avoidance. We do not find support for a moderating effect of uncertainty avoidance on the relationship between prediction-focused actions and time to disengagement.

3.5.1 Theoretical implications

With this study we contribute to a better understanding of the time to disengagement from new ventures, with the recognition that decreasing the time to disengagement can be beneficial to entrepreneurs' well-being and career development. First, we propose and find that increased engagement in entrepreneurial actions has different effects on the time to disengagement, depending on their focus on predicting the goal or controlling the means of new venture creation. Our results suggest that the more entrepreneurs engage in prediction-focused actions, the sooner they will disengage. By undertaking more prediction-focused actions entrepreneurs can reduce the uncertainty around the goal of new venture creation and thus, make earlier disengagement decisions. In contrast, the more entrepreneurs engage in control-focused actions, the more they tie themselves to the means of new venture creation, thus, the longer it takes them to disengage from the new venture creation process.

Whereas previous research has focused on the effects of prediction and control strategies on growth, profitability and survival (Brinckmann et al., 2010; Dew, Read, et al., 2009; Wiltbank et al., 2006), we test the effects of prediction-focused and control-focused behaviors on the time to disengagement. Our finding that increase in prediction-focused actions lowers the time to disengagement adds to the body of research that argues for undertaking predictive actions in new venture creation (Brinckmann et al., 2010; Delmar & Shane, 2004; Hopp & Greene, 2017). Engaging in more predictive actions pays off, not only because it increases the likelihood of venture emergence (Greene & Hopp, 2017), but also because it increases the likelihood of earlier termination as entrepreneurs gather predictive information about their goal of new venture creation. The positive impact of increased prediction-focused actions on shorter time to disengagement is 15 percentage points, which is similar to the effect sizes in other studies that investigate the role of prediction in new venture creation (Brinckmann et al., 2010; Burke et al., 2010; Greene & Hopp, 2017).

Furthermore, our results suggest that engaging in more control-focused actions and proactively acquiring and leveraging means for new venture creation can delay

disengagement. This new evidence reveals how engaging in actions to gain more control over the means of new venture creation (Dew, Sarasathy, et al., 2009; Sarasvathy, 2001) affects disengagement rather than performance (Wiltbank et al., 2009) or use of cognitive frames (Dew et al., 2009). Our results are underlined by the notion that prediction and control-focused behaviors imply varying degrees of cognitive, emotional, and motivational consequences (Osman & Speekenbrink, 2012). Overall, our findings extend the ongoing debate between prediction and control to the outcome of disengagement from venture creation, which has not been explored previously. Furthermore, unlike previous research that has focused on prediction and control as decision-making logics (Dew et al., 2009; Reymen et al., 2015), we investigate the constructs of prediction and control at the behavioral level, operationalizing them as the outcomes of increased entrepreneurial engagement in specific actions over time.

Second, we contribute to a more contextualized understanding of the disengagement outcome and the behavioral approaches that precede it. We find that the relationship between increased control-focused actions and time to disengagement varies between countries, depending on the country's level of uncertainty avoidance. Engaging in more control-focused behavior, thus, have different implications for entrepreneurs who eventually disengage, depending on how much their contexts enable them to tolerate uncertainty. We do not find support for a moderating effect of uncertainty avoidance on the relationship between increased prediction-focused actions and time to disengagement. Although there could be several explanations for this non-significant result, one methodological possibility is that the countries in our data set do not represent the full spectrum of the uncertainty avoidance dimension. Nevertheless, our finding challenges the extent to which entrepreneurial research on control-focused behaviors and their consequences (e.g., Kuechle et al., 2016; Mauer et al., 2018; Wiltbank et al., 2009) is valid across countries. Moreover, by investigating country-level impacts on the relationship between actions and time with regard to a specific outcome, we answer a call to engage more fully with the context when studying entrepreneurship (Zahra & Wright, 2011).

3.5.2 Practical implications

This study also has practical implications for aspiring entrepreneurs, educators, financiers, and support providers. The principal goal of the study is to enable practitioners to navigate successfully the complex landscape of the related strategic choices and behaviors. In view of the potential outcome of disengaging from venture creation based on the results of this study, undertaking more prediction-focused actions, such as business planning, can be a beneficial approach as it decreases the time to disengagement. When entrepreneurs in early stages of new venture creation decide which actions they should be undertaking and to what extent, they should reflect carefully on the range of potential outcomes including reaching profitability and disengagement.

The sooner an entrepreneur disengages from a venture to focus on other, more productive uses of resources, the more positive the disengagement outcome may be. In a time when new ventures receive increasing support from business incubators, entrepreneurial centers, and private financiers (Thompson, Scott, & Downing, 2012), the emphasis is on keeping venturing efforts alive. However, the alternative outcome of dying also should be taken into account. Is such support helping entrepreneurs push through inevitable difficulties, or is it creating the ‘living dead’?

3.5.3 Limitations and directions for research

We acknowledge some limitations of our study that researchers might address in the future. First, our unidimensional operationalization of the dependent variable can be further developed. Entrepreneurship scholars have suggested that disengagement is a multidimensional phenomenon (Coad, 2014), due to the variety of reasons why entrepreneurs disengage (Wennberg et al., 2010). However, a multidimensional investigation of the disengagement outcome was outside the scope of this research, due to data unavailability. Researchers could explore the relationship between actions and time to different types of disengagement. For example, increase in prediction-focused actions may lead to earlier disengagement of entrepreneurs who disengage to return to their employed careers, but later disengagement of those who disengage to start other ventures.

Second, we investigate the relationships between increase in prediction-focused actions and time to disengagement and increase in control-focused actions and time to disengagement independently. Current literature debates whether prediction and control are interdependent drivers of venture creation (Covin, Garrett, Gupta, Kuratko, & Shepherd, 2016) or independent constructs (Reymen et al., 2015). Our study subscribes to the idea of hybrid, simultaneous, independent uses of the two types of actions (Reymen et al., 2015; Smolka, Verheul, Burmeister-Lamp, & Heugens, 2016). However, researchers could also consider a sequential approach to engaging in prediction and control-focused actions. Entrepreneurship literature would benefit from further investigation of the relationship between actions and time of new venture process outcomes by accounting for interdependence between action types, as well as ordering effects. One way of achieving this is by conducting in-depth periodic and regular interviews with entrepreneurs to collect more comprehensive data on the order of prediction and control-focused actions.

Third, our approach to operationalizing and measuring uncertainty avoidance is open to debate. We operationalize the construct at the country level, theorizing about the role of context in the new venture creation process. Although a common operationalization of uncertainty avoidance (Hayton, George, & Zahra, 2002), it does not consider the effect of this variable at the individual level (Schoefer, 2010). Further exploration of the role of uncertainty avoidance at the individual level could lead to a more fine-grained empirical perspective on the proposed moderation effects.

Fourth, we note the sample size as a limitation. Our measure of uncertainty avoidance comes from the scores of the GLOBE study (House et al., 2004). The GLOBE scores (House et al., 2004) have previously been used in the same way in management and organization science research (Alas, 2006; Debus, Probst, König, & Kleinmann, 2012; Grinstein, 2008; Stephan & Uhlaner, 2010), including the field of entrepreneurship (Dickson et al., 2006; Zhao, Seibert, & Hills, 2005). As our sample consists of only four countries, the variance in the uncertainty avoidance scores is restricted and thus, interpretations of the interaction effects at each level of the moderator are limited. Nevertheless, our sample size is comparable to other studies. For example, Reimann et al. (2008) report findings based on only three countries, and Steensma et al. (2000) report a comparison of five countries. Future research could benefit from a larger cross-country comparison, with more countries included in the sample.

3.6 Conclusion

This study examined how an increase in two types of venturing behaviors, prediction-focused actions and control-focused actions, influences the time to disengagement from venture creation, as well as how country-level uncertainty avoidance affects these relationships. The results show that increased engagement in different types of actions, predictive and controlling, has distinct effects on the time entrepreneurs take to disengage from an unprofitable venture. They also show that the effect of increased control-focused actions is mitigated by a country's level of uncertainty avoidance. Thus, contextualized research on entrepreneurial behavior during the new venture creation process is critical, in that it can reveal how entrepreneurs time their decisions to abandon unprofitable new venture pursuits.



CHAPTER 4

Holding Back or Letting Go: A Social-Functional Perspective of New Venture Founders' Emotion Regulation⁶

ABSTRACT

This study examines how expressive suppression of negative emotions indirectly influences co-founders' relationship viability through perceptions of the suppressor's emotional authenticity. By including contextual factors that frame the new venture creation experience, the authors propose an overall moderated mediation model. They test their model in two empirical studies, a laboratory experiment and a field survey. Study 1 ($N = 80$ dyads) shows that in a zero-acquaintance context, experimental instructions to suppress negative emotions lead to lower teammate perceptions of emotional authenticity and subsequent lower relationship viability compared with instructions to express negative emotions. Study 2 ($N = 83$) shows that in a new venture creation context, founders' reports of habitual suppression of negative emotions in conditions of high frequency of negative events relate negatively to perceived emotional authenticity and therefore, to relationship viability. This study thus has theoretical implications for understanding the interpersonal effects of emotions in entrepreneurship.

Keywords: co-founders, emotion regulation, expressive suppression, emotional authenticity, relationship viability.

4.1 Introduction

Founding a new venture is an emotionally charged process. It is full of interrupted plans, unexpected obstacles, conflicting goals and unattainable aspirations (Morris et al., 2012) that give rise to negative emotions (Breugst & Shepherd, 2017; Shepherd, 2003). What should founders of new ventures do when they experience negative emotions? Should they “hold them back” or “let them go?” In a process known as emotion regulation (Gross, 2001), founders of new ventures exert effort to influence *which* emotions they have, *when* they have them and *how* they experience and express them. For founders, it is especially important to regulate negative emotions in the presence of significant others such as co-founders. How founders deal with the negative emotions may provide co-founders with relevant information about founders' emotional authenticity and foster beliefs about whether they can get along over the long term. Co-founders of new ventures have unique working relationships from the time they choose each other as partners (O'Toole et al., 2002; Ruef, Aldrich, & Carter, 2003) to the stage of venture creation, when the survival of their relationships is linked to the survival of their ventures (Alvarez, Svejnova, & Vives, 2007; Powell & Baker, 2017). Therefore, in this study, we ask how founders can regulate their negative emotions to improve interpersonal outcomes such as (1) initiating viable relationships with co-founders in context in which potential co-founders are strangers to each other (i.e., individuals of whom one has no prior knowledge), called a zero-acquaintance context (Albright, Kenny, & Malloy, 1988) and (2) sustaining viable relationships with co-founders in context in which actual co-founders are known to each other and in active pursuit of new venture creation, called the new venture creation context.

Although entrepreneurship research has recognized unequivocally that managing and regulating personal emotions is part of the role of new venture founders (Goss, 2008), we know very little about whether and how founders can regulate their negative emotions to improve interpersonal outcomes (Cardon et al., 2012; De Cock et al., 2017). Research shows that one common emotion regulation strategy is expressive suppression (suppression); it allows people to appear calm, cool and collected on the outside while experiencing emotional activation on the inside (Richards & Gross, 1999). In the context of relationships between co-founders of new ventures, it is particularly relevant to examine suppression, given that:

1. Founders are frequently confronted with volatile events that trigger negative emotions (Cacciotti, Hayton, Mitchell, & Giazitzoglu, 2016; Kollmann et al., 2017) and suppression is the most common strategy for dealing with such negative emotions (Gross & John, 2003);
2. Founders can regulate their emotional displays deliberately, to shape others' perceptions and actions (Cardon et al., 2012), such that suppression/expression of emotion is a form of resource mobilization (Lerner, 2016; Zott & Huy, 2007);

3. Suppression modifies individuals' behaviors in ways that others can observe – regardless of whether they are acquainted (Tackman & Srivastava, 2016) – and thus affects co-founders' perceptions and interpersonal outcomes from their very first encounters.

Moreover, because suppression reflects both stable personal factors and dynamic responses to situational contexts (Aldao, 2013; Brockman, Ciarrochi, Parker, & Kashdan, 2017; Koval, Butler, Hollenstein, Lanteigne, & Kuppens, 2015; Srivastava, Tamir, McGonigal, John, & Gross, 2009), we examine two issues: (1) how state-level suppression influences state-level social perceptions and interpersonal outcomes, particularly in zero-acquaintance contexts (Butler, Lee, & Gross, 2007; Tackman & Srivastava, 2016) and (2) how habitual suppression relates to more stable social perceptions and interpersonal outcomes (Srivastava et al., 2009) in the context of new venture creation.

To integrate the role of suppression of negative emotions into literature on entrepreneurial affect (Fang He, Sirén, Singh, Solomon, & von Krogh, 2018; Foo, Uy, & Murnieks, 2015) and investigate its interpersonal outcomes, we draw on social-functional theories of emotions, in particular the emotions as social information (EASI) model (Van Kleef, 2009). According to this model (Van Kleef, 2010), differential regulation of emotions can affect social interactions, because distinct emotion regulation strategies provide behavioral cues that other people use to form perceptions of suppressors and inform social relations (Tackman & Srivastava, 2016; Wang & Groth, 2014). The EASI model suggests that social-contextual factors can influence the relationship between emotional expressions and observers' perceptions (Stamkou, Van Kleef, Fischer, & Kret, 2016; Van Kleef et al., 2009; Van Kleef, 2010). In this study, we incorporate such social-contextual moderators as representative of the new venture creation experience.

Against this background, this study examines the role of suppression of negative emotions on the viability of founders' relationships via perceived emotional authenticity. We view emotional authenticity as part of a dialogical process between founders and others of significance (e.g., co-founders) to whom founders seek to articulate what is important (Hochschild, 1991; Taylor, 1992). The concept of authenticity is popular in many academic disciplines (Liedtka, 2008). However, to our knowledge, it has not received any attention in entrepreneurship literature (Brundin, Patzelt, & Shepherd, 2008), even though it has the potential to explain the perplexing dialogical process between entrepreneurs and their significant others (Chen, Yao, & Kotha, 2009; Lerner, 2016; Zott & Huy, 2007). We focus on co-founders' perceived emotional authenticity because it fosters social connectedness (Mazutis & Slawinski, 2015) and trust (Kim et al., 2017) – both of which are integral to initiating and building viable relationships (Alvarez et al., 2007; Newbert & Tornikoski, 2012; Ruef et al., 2003). Furthermore, the social-contextual factors that are representative of new venture creation, such as frequency and significance of emotion-eliciting events (Morris et al., 2012), can alter the effect of founders' suppression of negative emotion on emotional authenticity perceptions (Van Kleef et al., 2009).

To test our hypotheses, we conduct two empirical studies. The first is a laboratory experiment with 80 dyads in a zero-acquaintance context, in which we observe the controlled and immediate effects of experimentally instructed suppression on conversation partners' perceived emotional authenticity and behavioral intentions to continue working together. The second is a field survey of 83 founders of new ventures, in which we seek to understand how the habitual use of suppression affects co-founders' aggregate perceptions and overall relationship assessments, taking contextual factors (i.e., frequency and significance of negative events) into account. By combining findings from the two empirical investigations, we demonstrate that (1) in the zero-acquaintance context, suppression of negative emotions has a detrimental effect on co-founders' relationships through a decrease in perceived emotional authenticity (Study 1) and (2) in the new venture creation context, there is a negative indirect effect of habitual suppression on perceptions of emotional authenticity and consequent relationship viability only if the frequency of negative events is high (Study 2).

Our study makes several contributions. First, it extends the growing body of research on the role of emotions in entrepreneurship by providing a new theoretical lens that reveals that emotional experiences do not only have intrapersonal, but also interpersonal effects. Specifically, by introducing the well-established EASI model to the domain of entrepreneurship research, our study identifies the social function of emotion suppression during new venture creation. By providing evidence that suppression of negative emotions can have implications for relationships between co-founders, we provide the first scholarly examination of the social effects of negative emotions (Doern & Goss, 2014) during new venture creation.

Second, our study is among the first to explore the antecedents of the initiation and maintenance of viable relationships between co-founders. We propose and find that perceived emotional authenticity is an important predictor of founders' intentions to establish relationships with potential co-founders with whom they have zero acquaintance. Authenticity is also an important consideration for the relationship viability of actual co-founders during new venture creation, depending on the frequency of negative events that the ventures face.

Third, our study contributes to the social-functional theories of emotion, more specifically to the EASI model. By applying the tenets of the EASI model to explain relationship outcomes of new venture co-founders, we test and confirm the robustness of the model in a qualitatively different type of relationship, with specific decision mechanisms and interactions (Fiske, 1992).

4.2 Theoretical background

4.2.1 Emotions as social information model

Organization science research has shifted its perspective on emotions in the workplace from being predominantly intrapersonal to inclusive of the interpersonal domain (Côté,

2005; Sy, Côté, & Saavedra, 2005; Van Kleef et al., 2009). A significant effort in this direction was made by Van Kleef (2009), who built on the social-functional approaches to emotions and introduced the emotions as social information (EASI) model. According to Van Kleef, Homan, & Cheshin (2012, p. 312), “organization members do not just experience their emotions; they also express them to others.” The EASI model explains that the outward expression of emotions shapes organizational behavior by influencing others’ feelings, attitudes and thoughts. The model has been tested within large organizations (Van Kleef, 2014; Van Kleef et al., 2012) and in contexts involving conflict and negotiation (Van Kleef, De Dreu, & Manstead, 2004), leadership and team performance (Van Kleef, Anastasopoulou, & Nijstad, 2010) and employee–customer interactions (Wang et al., 2017). The EASI model comprises two main propositions: (1) Workplace emotions trigger affective reactions in perceivers, which in turn shape their behavior; and (2) workplace emotions trigger inferential processes in perceivers, which in turn shape their behavior (Van Kleef et al., 2009; Van Kleef, 2010). The model also suggests that social-contextual factors affect the inferential processes of perceivers (Johnson, Griffith, & Buckley, 2016; Wang & Groth, 2014).

In parallel with organization science, entrepreneurship research traditionally has engaged in understanding how emotions influence intrapersonal processes related to judgments of opportunities and decision making (Foo, 2011; Ivanova, Treffers, & Langerak, 2018; Podoyntsina et al., 2012; Welpé et al., 2012), entrepreneurs’ venturing efforts and behaviors (Foo, Uy, & Baron, 2009; Hatak & Snellman, 2017) and entrepreneurs’ attitudes toward exit (Shepherd et al., 2009). However, research on the interpersonal effects of emotions (Cardon et al., 2012) is far less advanced; it has been limited to investigating phenomena such as the contagious effect of entrepreneurial passion (Breugst, Domurath, Patzelt, & Klaukien, 2012) and the emotional reactions to conflict in entrepreneurial teams (Breugst & Shepherd, 2017). In line with the social-functional approach in organization science, researchers note that entrepreneurs’ emotional expressions affect others’ perceptions (Cardon, 2008; Chen et al., 2009; Lerner, 2016). We continue this trend in entrepreneurship research by introducing the EASI model to explain how new venture founders’ emotion regulation processes influence their co-founders’ attitudes and thoughts and shape new venture creation outcomes.

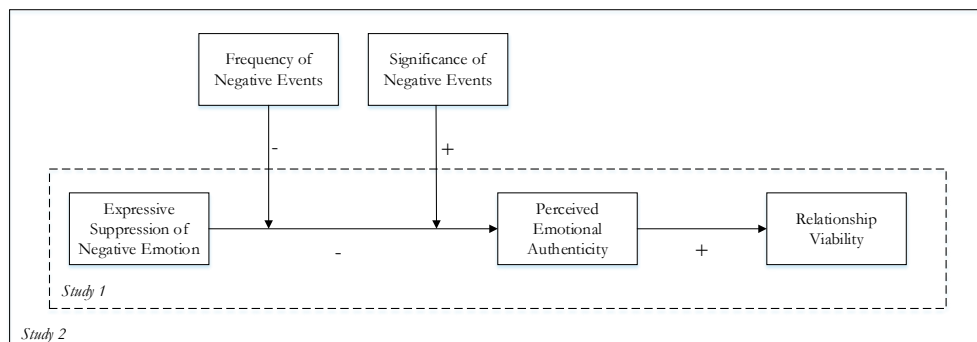
Previous research indicates that emotional expressions of discrete emotions, such as anger, happiness, disappointment and regret, are important sources of information in various contexts (Van Kleef et al., 2004, 2012; Van Kleef & Dreu, 2010) including entrepreneurship, in which the expression of positive emotions influences interactions with investors (Chen et al., 2009) and employees (Cardon, 2008). Furthermore, there is evidence that suppressing the outward expression of emotions has ramifications for interpersonal outcomes. For example, Wang & Groth (2014) show that suppressing negative emotions directly predicts customers’ satisfaction in service interactions characterized by high personalization and high frequency of contact between service providers and customers.

According to the EASI model, the effects may be due to the fact that perceivers acquire less revealing information from those who suppress their emotional expressions (Van Kleef, 2010). Thus, the suppression of emotional expression may be a crucial predictor of socially competent behavior and successful social relations (Bell & Calkins, 2000).

4.2.2 Suppression of negative emotions as social information in new venture creation

The ways people deal with their emotional experiences is known as emotion regulation (Gross, 1998). The process model of emotion regulation considers temporal consequences in emotional experiences (Gross, 2001). It starts with antecedent-focused strategies for altering emotional experiences and continues with response-focused strategies for modifying affective signaling. In this study, we focus on the response-focused regulation strategy of suppression for two reasons: It influences the interpersonal domain (Butler, Gross, & Barnard, 2014; Kalokerinos, Greenaway, Pedder, & Margetts, 2014; Le & Impett, 2016) and negative emotions during new venture creation are difficult to anticipate, such that it would be difficult to apply antecedent-focused emotion regulation strategies. Suppression is defined as a response-focused emotion regulation strategy that involves emotional inhibition of the behavioral component of an emotion (e.g., facial, gestural, or verbal expression) after an emotional response has been elicited (Gross, 1998; Srivastava et al., 2009).

Because suppression connects people's intrapersonal emotional experiences with the social world, it has the potential to shape social interactions between unacquainted individuals (Tackman & Srivastava, 2016) as well as interpersonal relationships between long-term partners (Impett, Le, Kogan, Oveis, & Keltner, 2014; Le & Impett, 2013). Suppression is mostly disadvantageous to interpersonal outcomes, because it lowers social support, impairs interpersonal closeness, reduces relationship satisfaction (English & John, 2013; Gross & John, 2003; Srivastava et al., 2009) and leads to poorer communication and rapport (Butler et al., 2003). Such negative interpersonal consequences of suppressing negative emotions are driven by discrepancies between underlying emotional experiences and resulting displays, which create a pervasive sense of emotional inauthenticity (Ekman et al., 1987; Ekman & Friesen, 2003; English, John, & Gross, 2013). Although the mediating role of emotional authenticity in the relationship between suppression and interpersonal outcomes has been tested in empirical studies (English & John, 2013), we have not identified any prior studies that investigate how actual suppression influences others' perceptions of emotional authenticity. To develop insights into the social function of negative emotion suppression during new venture creation, we build on the EASI model to propose the conceptual model in Figure 4.1.



Note: Entire model tested in Study 2. Model in the dotted lines tested in Study 1.

Figure 4.1 Conceptual Model

4.3 Hypotheses development

4.3.1 The effect of suppression of negative emotion on relationship viability through perceived emotional authenticity

Response-focused strategies of emotion regulation, such as suppression, are more likely to result in inauthenticity, because they reduce the expression, but not the experience, of an emotion (English & John, 2013; Groth, Hennig-Thurau, & Walsh, 2009; Impett et al., 2014; Le & Impett, 2013). This effect is exemplified by those who suppress their own emotional expressions as internal feelings of being inauthentic (English & John, 2013) or by those who observe the suppression of others as perceptions of suppressors' emotional inauthenticity (Impett et al., 2014). These findings reflect the polemic nature of the authenticity concept, which can be located in the self or in others (Peterson, 2005). We subscribe to conceptualization of authenticity as socially constructed (Liedtka, 2008; Peterson, 2005) and thus focus on others' perceptions of suppressors' emotional authenticity and how they may be reduced because the suppression interferes with emotional communication channels while leaving traces of experienced emotions (English & John, 2013) that others can observe through subtle facial cues (Ekman & Friesen, 2003). Hochschild (1991) argues that when a person suppresses emotions and presents a "mask" of what is expected (explicitly or implicitly), there is a separation of the self into the "true" and "false" self (Hochschild, 1991). If, for example, a founder experiences fear as a result of a recent loss of valuable resources but suppresses any expression of this fear in front of co-founders, the co-founders may notice the discrepancy between the suppressor's true and false selves and perceive the suppressor as emotionally inauthentic. Furthermore, suppression leads to others' perceptions of emotional inauthenticity even *before* a relationship has been established, because it biases the first impression created in others in a zero-acquaintance context (Tackman & Srivastava, 2016).

The perception that co-founders are having inauthentic emotional reactions signals that

they are not being honest and sincere (Hochschild, 1991; Kernis, 2003) and do not regard the survival of the venture as important (English & John, 2013; O'Neil & Ucbasaran, 2016). Co-founders may perceive that suppressing founders are making unethical attempts to manipulate them (Côté, Hideg, & Van Kleef, 2013). Furthermore, founders' communications of their "true" selves predict whether new venture co-founders will come together initially and remain together during the venture creation (Powell & Baker, 2017). Accordingly, we expect that at a zero-acquaintance context, initial perceptions of emotional inauthenticity lower founders' desires for future affiliation (Tackman & Srivastava, 2016) and their intentions to establish working relationships with potential co-founders. We further predict that the relationships between existing co-founders who perceive each other as emotionally inauthentic in the face of negative events will be damaged, because they experience less satisfaction from working together and have lower intentions to continue working together in the future.

Formally, we expect that perceiving a co-founder as emotionally inauthentic will be damaging to the relationship between co-founders. In line with the EASI model, we theorize that perceived emotional authenticity fosters affective reactions and inferential processes in co-founders, which inform their evaluations of relationship viability (Van Kleef, Homan & Cheshin, 2012). Similar to Hackman (1987), we define relationship viability of new venture co-founders as founders' "satisfaction, participation and willingness to continue working together" (p. 122). Viability is an affective-laden construct (Barrick, Stewart, Neubert, & Mount, 1998) that entails a temporal inference about the continuation of working relationships (Bell & Marentette, 2011; Marks, Mathieu, & Zaccaro, 2001). A person's intention to affiliate and form a relationship with others can be informed by perceptions created in the very first minutes, or even seconds, of a social interaction (Ambady, Hallahan, & Rosenthal, 1995; Borkenau & Liebler, 1992; Carney, Colvin, & Hall, 2007). In this study, to encompass the entire life cycle of a new venture (Aldrich & Kim, 2007), we investigate the construct of relationship viability in two different contexts: (1) zero-acquaintance and (2) new venture creation, to understand the nature of relationship formation between unacquainted (i.e., potential) co-founders, as well as existing relationships between actual co-founders. For potential co-founders, initiating viable relationships in zero-acquaintance contexts is important, because it informs whom they choose to partner with in their effort to establish new ventures (Forster & Jansen, 2010; O'Toole et al., 2002; Ruef et al., 2003). Sustaining viable relationships continues to be important during new venture creation, because the relationships are still fragile, and ventures will not survive unless their co-founders continue to work together (Foo et al., 2006).

In summary, suppression may decrease perceived emotional authenticity and perceived emotional authenticity should relate positively to relationship viability. Therefore, we expect the overall indirect effect of suppression on relationship viability via perceived emotional authenticity (a product of the two direct effects) (Rucker, Preacher, Tormala, & Petty, 2011) to be negative. Moreover, we propose that this indirect effect can be observed in both zero-acquaintance and new venture creation contexts. Formally,

H1: Suppression of negative emotions has a negative indirect effect on relationship viability through decreased perceived emotional authenticity in a (a) zero-acquaintance context and (b) new venture creation context.

4.3.2 Frequency and significance of negative events

In the new venture context, because existing co-founders spend significant amounts of time together, negative events accumulate (Cacciotti et al., 2016; Cardon, Stevens, & Potter, 2011; Kollmann et al., 2017). Unlike the zero-acquaintance context, in which people form perceptions based on emotional reactions to a single negative event, the interpersonal effects of suppression on relationship viability through perceived emotional authenticity in the new venture context may stem from cumulative negative emotional experiences (Gabriel, Acosta, & Grandey, 2015; Gardner, Fischer, & Hunt, 2009; Wang & Groth, 2014). The EASI model (Van Kleef, 2009) identifies potential social-contextual moderating factors that may affect perceptual processes in perceivers (Johnson et al., 2016; Wang & Groth, 2014). The impact of suppression may differ according to the settings in which it is used; social context may have substantial impacts on and expectations of behavior (Rusbult & Van Lange, 2003). Therefore, the effects of the suppression of negative emotion on perceptual processes across situations may not be consistent, due to the boundaries placed on the abilities and expectations related to suppression in given settings (Johnson et al., 2016). Moderators may influence the perceptual processes of perceivers (e.g., power status, need for closure, group membership, rules for organizational display) at organizational, situational and personal levels (Gardner et al., 2009; Johnson et al., 2016; Solak, Reifen Tagar, Cohen-Chen, Saguy, & Halperin, 2017). In the new venture creation context, we investigate two specific situational variables, namely, the frequency and significance of negative events (Morris et al., 2012).

As the frequency of negative events increases, the use of emotion regulation and suppression also increases (Diefendorff, Richard, & Yang, 2008) and becomes more accessible to perceivers' attention. Therefore, for perceiving co-founders, the effect of suppression on perceived emotional authenticity is more pronounced when the venturing experience is characterized by a high frequency of negative events. If negative events are scarce, perceivers have fewer opportunities to observe the suppression of negative emotion and suppression does not inform their more general and stable perceptions of suppressors' emotional authenticity. Overall, we expect the effect of suppression on others' perceived emotional authenticity will become stronger as the frequency of negative events increases.

When the significance of negative events increases, perceivers instead might expect others to remain calm, cool and collected in order to successfully resolve the incident (Barrett, Gross, Christensen, & Benvenuto, 2001). Furthermore, founders of new ventures in settings marked by highly significant negative events are less likely to process emotional information and more likely to focus on motivationally relevant information (Frijda, 1986;

Smith & Pope, 1992). Accordingly, they may not notice the suppression of co-founders' emotions or could interpret it as a sign of goal orientation, designed to overcome highly significant negative events. In contrast, if the negative events are less significant, the suppression of negative emotions becomes more inappropriate (Aldao & Nolen-Hoeksema, 2012) and increases others' perceptions of emotional inauthenticity. Thus, the negative effect of suppression on perceptions of emotional authenticity and social outcomes may be mitigated in settings of negative events with high significance. Therefore, we formally propose that:

H2: In the new venture creation context, the negative indirect effect of suppression of negative emotions on relationship viability through perceived emotional authenticity is (a) stronger when the frequency of negative events is higher and (b) weaker when the significance of negative events is higher.

4.4 Overview of empirical investigations

The aim of our research was to investigate the relationship between potential co-founders in the zero-acquaintance context and between actual co-founders in the new venture creation context, so we conducted two studies in these two different contexts. In Study 1, we investigated whether suppression leads to negative social outcomes, before a relationship is established, by biasing initial perceptions and lowering behavioral intentions to continue working together (Tackman & Srivastava, 2016). We also explored the relationship between suppression, operationalized as a state-like strategy for emotion regulation, and state-level social perceptions. Hence, Study 1 is a laboratory experiment in which we assigned unacquainted participants to experimental roles of suppressors and perceivers to test the effect of state suppression on state perceptions and outcomes generated in a zero-acquaintance context. In particular, we investigated whether counterparts perceived participants' suppression of negative emotions as inauthentic, resulting in lower willingness to work together in a hypothetical new venture.

In Study 2, we investigated the effect of suppression on interpersonal outcomes in the context of new venture creation, taking into account the settings in which suppression occurs. We also explored the habitual use of suppression as a negative emotion regulation strategy and examined its relationship with more stable perceptual and interpersonal outcomes. Study 2 is based on a sample of actual new venture co-founders, who were fully immersed in the new venture creation experience, characterized by varying dimensions of frequency and significance of the negative events faced by the venture.

The two studies complement and support each other: The lab experiment optimized internal validity by allowing us to investigate the causal influence of suppression on the immediate perceptions and behavioral intentions of participants, whereas the field study

optimized external validity by allowing us to incorporate moderating effects of the context, in which suppression is presented.

4.5 Study 1: Method

4.5.1 Sample

In Study 1, we used an experimental approach to study the consequences of suppression of negative emotions in a zero-acquaintance context and to test Hypothesis 1a (Butler et al., 2003; Tackman & Srivastava, 2016). We drew a sample of 160 undergraduate students enrolled in an introductory management course at an Australian university. The experimental task was comprehensible to them and a student sample provides a good representation of co-founders in a zero-acquaintance context, because many co-founders meet in organizations such as universities or research labs (e.g., Larry Page and Sergey Brin met and co-founded Google while studying at Stanford) (Alvarez et al., 2007).

We recruited participants using participant management software; they were given course credit for participating. All participants were invited in teams of two (i.e., dyads) to their assigned experimental sessions. We used dyads because of their unique structure, which involves only one relationship, and because emotions tend to be stronger in dyads than in multiple-member relationships (Rouse, 2018). Furthermore, previous sociological review of new venture founding teams shows that most ventures have two co-founders (Ruef et al., 2003). The participants were on average 18 years of age (standard deviation [*SD*] = 1.54) and 52.5% were women. The experiment has a 2 x 2 between-subjects factorial design (emotion regulation: suppression vs. expression) x (role: regulator vs. target), resulting in four experimental conditions.

4.5.2 Experimental procedure

Figure 4.2 outlines the experimental procedure. On arrival at the laboratory, participants signed a consent form and completed a questionnaire that consisted of various measures of individual differences, including habitual use of emotion suppression and expression (Gross & John, 2003) and demographic questions. At the beginning of the study, the two members of a randomly paired dyad were introduced as teammates. Members of each dyad then watched a short film clip, positioned in a way such that they could see their screens but not each other. The film was a 10-minute clip from the movie *Ratter*. We selected the film as an induction procedure of negative emotions; it shows a compilation of a young woman being cyber-stalked and ultimately mobbed by the stalker (see Appendix 3.1 for pre-test of the film clip).

After each dyad watched the film, we presented one of the members (the regulator) with on-screen instructions to suppress or express their emotional reactions for the remainder of the experiment. We used standard instructions modified from Peters & Jamieson (2016)

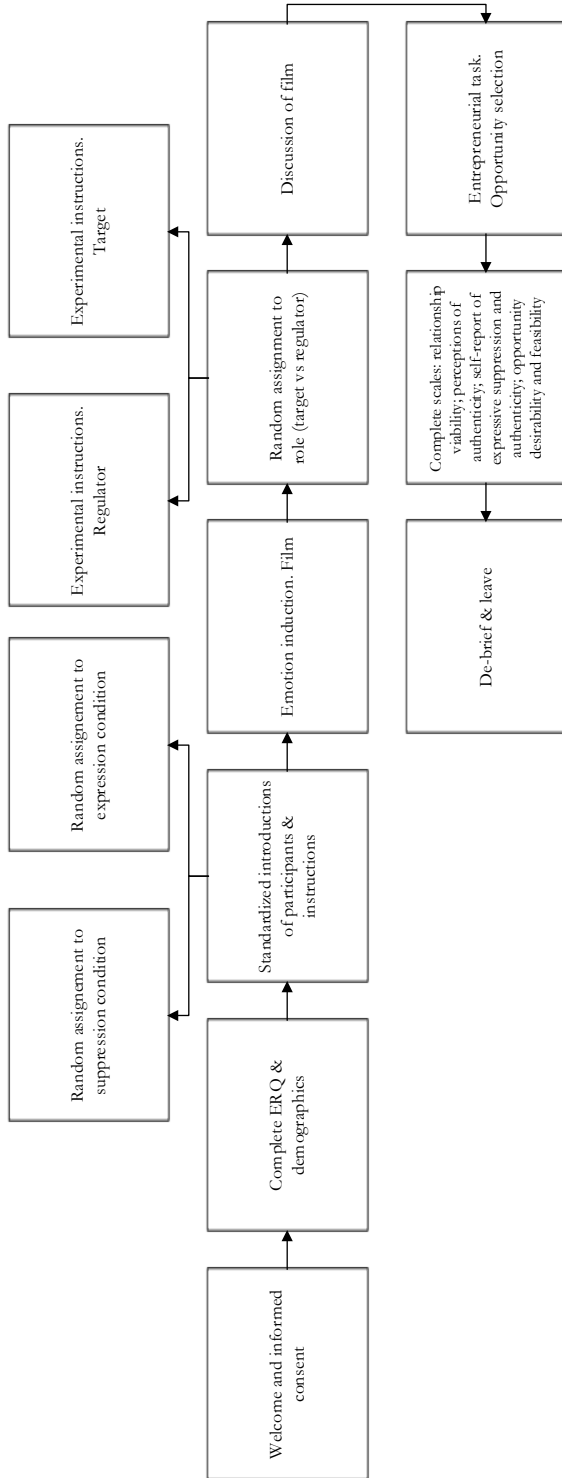


Figure 4.2 Experimental Procedure, Study 1

and Richards & Gross (1999). At the same time, we presented the other member of the team (the target), with on-screen instructions to pay attention to the emotional expressions of their teammate for the remainder of the experiment (see Appendix 3.2).

We gave participants the task to discuss the clip they watched, following a set of questions that included: “What were your thoughts and feelings during the film? Which parts of the film do you remember most vividly? What is the relevance of the film to you/to your daily life? What are the main issues that the film raises? What are its implications for society?”

After participants discussed the film for five minutes, the administrator of the experiments interrupted each dyad and assigned a task: choose between two entrepreneurial opportunities to address the problem of cyber-stalking as depicted in the film clip (see Appendix 3.3 for a full description of opportunities). Both entrepreneurial opportunities used the same technological innovation but proposed different applications of the innovation, with one representing a business-to-business offering and the other representing a business-to-consumer offering. The two opportunities were given in random order across the 80 dyads.

After each dyad made a choice between which of the two opportunities they would like to pursue as co-founders of a newly created venture, they went back to their computers to complete the main study measurements. At this point, we measured participants’ willingness to continue working on the selected opportunity with the teammate as co-founder (i.e., dependent variable of relationship viability) (Lerner, 2016). Judgments of opportunity desirability and feasibility were also measured and included in a test of alternative explanation, subsequently outlined. We also measured the mediator of perceived emotional authenticity) (Impett et al., 2014). Next, participants completed manipulation checks that included targets’ perceptions of regulators’ emotion regulation (Impett et al., 2014) and regulators’ self-reports of emotion regulation. Finally, we asked all participants to identify the purpose of the study and indicate whether they thought the situation depicted was realistic. After the study was over, we debriefed and dismissed each participant. The entire experiment took about 60 minutes per dyad.

4.5.3 Experimental manipulation

The main experimental manipulation into conditions of expression and suppression was delivered only to the sub-sample of regulators. We randomly assigned half to the expression condition ($N = 40$) and half to the suppression condition ($N = 40$). To manipulate the emotion regulatory processes under investigation, we used a well-established procedure from previous laboratory experiments on the interpersonal effects of emotion regulation strategies (Butler et al., 2007; Egloff, Schmukle, Burns, & Schwerdtfeger, 2006; Greenaway & Kalokerinos, 2017; Gutentag, Halperin, Porat, Bigman, & Tamir, 2017). This procedure includes on-screen experimental instructions (see Appendix 3.2). To check whether the experimental manipulation had its intended effects, we conducted a manipulation check.

Table 4.1 Results from Manipulation Check

| | <i>Regulator</i> | | | | <i>Target</i> | | | |
|------------------------|----------------------|-----------|----|-----------|----------------------|--------|----|-----------|
| | 95% CI for Mean Dif. | t | Df | Cohen's d | 95% CI for Mean Dif. | t | Df | Cohen's d |
| Suppression condition | -2.69; -1.84 | -10.74*** | 78 | 2.40 | -0.80; 0.28 | -0.95 | 78 | |
| Suppression perception | -0.37; 0.51 | 0.32 | 78 | | 0.31; 1.32 | -2.20* | 78 | 0.49 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

4.5.4 Manipulation check

We report the results from the manipulation check in Table 4.1. The independent sample t-tests revealed the intended effect of the suppression manipulation ($t[78] = -10.74$, $p < 0.001$, $d = 2.40$), such that regulators in the suppression condition (mean $[M] = 5.27$, $SD = 0.87$) reported suppressing more than regulators in the express condition ($M = 3.01$, $SD = 1.01$), with a 95% confidence interval (CI) of (-2.69, -1.84). In the sample of targets, the intended effect of the suppression manipulation ($t[78] = -2.20$, $p < 0.05$, $d = 0.49$) emerged, such that targets of regulators in the suppression condition ($M = 4.14$, $SD = 1.14$) perceived their teammates as suppressing more than targets whose teammates were in the expression condition ($M = 3.64$, $SD = 0.90$), 95% CI (0.31, 1.32).

4.5.5 Measurements

Dependent Variable (target participants): In a zero-acquaintance context, no relationship exists, so the only thing that can be observed is the participants' future-directed desire to affiliate and build a relationship (Tackman & Srivastava, 2016). Therefore, we measured the future-directed intention element of relationship viability, reflected in participants' willingness to continue working together at zero-acquaintance. To measure the dependent variable, target participants completed four items adapted from Lerner (2016), with the following instruction: "Please indicate what is your estimated likelihood, on a scale from 0 to 100%, that:

1. You would accept an offer to work as an employee in the venture with your teammate as the founder;
2. You would accept an offer for financial and social capital (e.g., funding and managerial support from an investor) to develop the selected venture further with your teammate as a co-founder;
3. You would accept an offer from your teammate to join as a full-time co-founder on another venture;
4. You would accept an offer for a full-time job that will allow you to work again with your teammate."

The Cronbach's alpha for the scale was 0.74, which is considered reliable (Hair et al., 2006). Principal component analyses with both Varimax and Promax rotations yield factor loadings above and equal to 0.60 (eigenvalue of 2.30 and 57.47% variance explained).

Mediator (target participants): To measure perceived emotional authenticity, target participants completed a single item: "My teammate's emotional reactions during our discussion were authentic (true to him/herself)." Previous research has found that when addressing concrete constructs, such as perceived emotional authenticity, single-item measurements can be as valid as multiple-item measurements (Bergkvist & Rossiter, 2007, 2009). We measured this item on a scale from 1 = "Strongly disagree" to 7 = "Strongly agree," as used in previous research (Impett et al., 2012; Le & Impett, 2013).

4.6 Study 1: Results and discussion

4.6.1 Hypotheses testing

Table 4.2 shows all means, standard deviations and correlations of all variables. The correlation between regulators' trait emotion suppression and experimental condition of emotion suppression was not significant ($r = 0.18$, $p = 0.11$), which suggests a random distribution of the trait emotion suppression across experimental conditions. Furthermore, we found a positive correlation between regulators' gender and experimental condition ($r = 0.23$, $p < 0.05$), indicating that we had an unequal distribution of gender across the conditions, with more women ($N = 27$) than men ($N = 13$) in the suppression condition. To account for this unequal distribution, we added the regulator's gender as a control variable in our models (males = 1; females = 2).

To test H1a, that suppression of negative emotions has a negative indirect effect on relationship viability through perceived emotional authenticity, we performed a mediation analysis. We used SPSS macro PROCESS (Model 4) with 10,000 repetitions (Hayes, 2012). Previous research finds evidence for the benefits of bootstrapping over other methods for testing indirect effects (MacKinnon et al., 2002). PROCESS is used to compute the indirect effect as a product of the direct effect of suppression on perceived emotional authenticity and the direct effect of perceived emotional authenticity on relationship viability (Preacher & Hayes, 2008).

As expected, suppression had a significant, negative, direct effect on perceived emotional authenticity ($\beta = -0.64$, $t = -2.50$, $p < 0.05$). Furthermore, perceived emotional authenticity had a significant, positive, direct effect on relationship viability ($\beta = 3.51$, $t = 2.11$, $p < 0.05$). The indirect effect of suppression on relationship viability through perceived emotional authenticity was also significant, according to a bias-corrected bootstrapping procedure with 10,000 samples (Preacher & Hayes, 2008). In support of H1a, there is a significant, negative, indirect effect of suppression ($\beta = -0.07$, [BCa 95% CI] = [-0.17, -0.01]) on relationship viability via perceived emotional authenticity in a zero-acquaintance context. The significance of the negative indirect effect is indicated by the CIs not containing zero.

Table 4.2 Means (M), Standard Deviations (SD) and Pearson Correlations of Study 1 Variables

| | <i>M</i> | <i>SD</i> | 2 | 3 | 4 | 5 | 6 |
|--------------------------------------|----------|-----------|------|--------|--------|-------|-------|
| (1) Suppression condition | 0.50 | 0.50 | 0.18 | -0.22* | -0.28* | -0.05 | 0.23* |
| (2) Regulator's suppression trait | 3.99 | 1.15 | | 0.13 | -0.14 | -0.06 | 0.08 |
| (3) Relationship viability | 58.10 | 16.90 | | | 0.28* | 0.05 | -0.20 |
| (4) Perceived emotional authenticity | 5.09 | 1.14 | | | | 0.14 | -0.04 |
| (5) Target gender | 1.53 | 0.50 | | | | | -0.08 |
| (6) Regulator gender | 1.56 | 0.50 | | | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

Table 4.3 Direct, Indirect and Total Effects of Suppression and Perceived Emotional Authenticity on Relationship Viability

| | | <i>Perceived Emotional Authenticity</i> | | <i>Relationship Viability</i> | |
|-----------------|----------------------------------|---|----------------------------|------------------------------------|-------------------------------|
| | | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Direct effects | Constant | 5.33 | 0.42 | 50.66 | 10.69 |
| | Suppression | -0.64* | 0.25 | -4.00 | 3.85 |
| | Perceived emotional authenticity | | | 3.51* | 1.66 |
| | Regulator gender | 0.05 | 0.26 | -5.38 | 3.74 |
| | | $R^2 = 0.08$; $F(2, 77) = 3.20$, | | $R^2 = 0.12$; $F(3, 76) = 3.54$, | |
| | | $p < 0.05$ | | $p < 0.05$ | |
| Indirect effect | | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit 95%CI</i> | <i>Boot Upper Limit 95%CI</i> |
| | Suppression | -0.07* | 0.04 | -0.17 | -0.01 |
| Total effect | | | <i>Coefficient</i> | <i>Standard Error</i> | |
| | Constant | | 69.37 | 6.12 | |
| | Suppression | | -6.23 | 3.79 | |
| | Regulator gender | | -5.22 | 3.82 | |
| | | $R^2 = 0.07$; $F(2, 77) = 2.95$, $p = 0.06$ | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

4.6.2 Alternative explanations

There is an alternative explanation for why targets of suppressors, in comparison with targets of expressors, experience reduced relationship viability: Instead of affecting the social perception process, the suppression of negative emotions may have affected the decision-making process (Yang, Tang, Gu, Luo, & Luo, 2015) and subsequent opportunity judgment (Tumasjan & Braun, 2012). Research has shown that people's judgments of opportunities are influenced by their intrapersonal emotional processes (Foo, 2011; Podoyntsyna et al., 2012; Welpe et al., 2012) and self-regulatory processes (Cooper, Peake, & Watson, 2016; Tang, 2009; Tumasjan & Braun, 2012). Therefore, it is possible that targets of suppressors not only judge their teammates differently but also judge opportunities differently, such that their reduced willingness to continue working with teammates is driven by their reduced judgments of opportunities.

To rule out this alternative explanation, we estimated the mediation model with two mediators: (1) judgments of opportunity desirability and (2) judgments of opportunity feasibility (Ivanova et al., 2018). We used the same dependent and independent variables as in the main model. Tables 3.4.1 & 3.4.2 in Appendix 3.4 report the results. We found no significant indirect relationship between our emotion regulation conditions and relationship viability via either opportunity desirability or opportunity feasibility. Therefore, the effect of suppression on relationship viability, reported in this experimental study, cannot be explained by an overall effect on judgment processes. Therefore, our social-functional explanation is supported.

4.6.3 Discussion

Study 1 provides evidence of the negative indirect effect of suppression of negative emotions on targets' evaluations of the viability of their relationships with suppressors, through decreased perceptions of emotional authenticity in a zero-acquaintance context. It shows that experimentally induced suppression of negative emotions in a social interaction negatively influences how authentic others perceive the suppressor to be. It also shows that this perception of emotional authenticity is a predictor of willingness to work with others. In Study 1, we operationalized relationship viability as intention to work together again, on the same or a different opportunity. Hackman (1987) defines this intention as one of the elements of relationship viability.

Although this study is informative about the initial contact between potential co-founders in a zero-acquaintance context, it is limited in explaining relationship outcomes for actual new venture co-founders who have known each other and experienced negative events together. To address this limitation, we conducted Study 2, a field study in a context of new venture creation.

4.7 Study 2: Method

4.7.1 Participants and procedures

In Study 2, we used a sample of new venture co-founders in entrepreneurship centers and incubators that were in the early stages of venture creation (Breugst & Shepherd, 2017) and whose relationships had evolved beyond initial acquaintance. We identified potential participants by reviewing the web pages of all entrepreneurship centers and incubators in a large German metropolitan area, which resulted in a list of 97 ventures, all participating in an accelerator or incubator program at the time of data collection.

We visited the ventures in person to ask them to participate in our study. From this procedure, we received responses from 106 participants in 43 ventures (response rate of 44.3% from the initial 97 ventures identified). The distribution of 106 participants in the 43 ventures was as follows: In four ventures only one person per venture completed the

questionnaire; in 24 ventures, two participants per venture participated; in nine ventures, three participants per venture participated; in four ventures, four participants per venture participated; in one venture, five participants per venture participated; and in one, six participated.

The founders of ventures were identified according to three criteria, based on Klotz et al. (2014), Ensley, Pearce, & Hmieleski (2006) and Ucbasaran, Lockett, Wright, & Westhead (2003): (1) participants who confirmed they were responsible for the strategic decision making and ongoing operations of their venture (“Are you primary responsible for the strategic decision making and ongoing operations of this venture?”); (2) participants who were perceived by the other founders as being responsible for the strategic decision making and ongoing operation of the venture; and (3) participants who indicated they will own part of the venture, once it is operational (“Once this venture is operational, will you personally own all, part, or none of this venture?”). At this stage, we removed three participants from the sample because they did not meet any of the three criteria to qualify as founders. For seven participants, there was a disagreement between their self-reports of being responsible for the strategic decision making and ongoing operations of their ventures and others’ perceptions of whether they were responsible. This disagreement was resolved with a follow-up discussion as well as a crosscheck of the ventures’ websites and/or individual participants’ LinkedIn pages. We eventually included these seven participants in the sample, such that our sample of venture founders was 103.

We further reduced the sample by removing (1) four participants because they were the only participants from their venture who completed the instrument; (2) 12 participants because they did not follow our instructions to list the negative events (i.e., obstacles) experienced by their ventures; and (3) four participants because they had missing data on at least one of the variables used to test the study hypotheses. Therefore, our final sample, used for statistical analyses, had 83 participants.

The average age of participants was 31 years ($SD = 4.81$) and 13.80% were women. Most participants’ highest education was a masters’ degree (64.40%), followed by a bachelor’s degree (21.80%) or doctoral degree (10.30%); the remaining participants had a high school diploma (3.40%). In terms of educational background, the sample came from a variety of disciplines: business administration and law (33.30%), engineering and construction (23.00%), information and communication technologies (26.40%), sciences and mathematics (11.50%), arts and humanities (3.40%) and social sciences (2.30%). Table 4.4 provides the descriptive statistics.

During our visits to their offices, venture founders completed the questionnaire in person by logging on to survey software (www.qualtrics.com). After stating their name and the name of their ventures, participants indicated whether they were responsible for the strategic decision making and operations of their ventures and also listed the names of co-founders who were responsible for strategic decision making and operations. The rest of the questionnaire consisted of three parts. In the first part, each participant was asked to rate

the viability of their relationships with each of their co-founders. In the second part, each participant was asked to recall the negative events, i.e., obstacles, faced by their ventures with the following instructions:

“New ventures, such as yours, are frequently confronted with obstacles, threatening their success, competitive advantage and survival. Please try to recall the obstacles, faced by your venture, which made you fear its success, competitive advantage or survival. By obstacles, we mean significant negative changes as compared to previous situation, resulting from external problems, outside your control. For example, required financial resources are no longer available, the demand for your product/service drops sharply, or you lose support from your social environment. Please list as many of these obstacles as you can recall. In the next questions we will ask you to go back to your recollections of these obstacles and answer some questions.”

In the third part, after respondents listed the obstacles in a free-text format, they gave self-reports of their emotion regulation in response to these negative events (independent variable) as well as their perceptions of co-founders' emotional authenticity.

4.7.2 Measurements

We used a round-robin approach (McClean, Martin, Emich, & Woodruff, 2018) to construct the survey, such that we asked every participant to provide a self-report of their own suppression in the face of negative events, perceptions of each of their co-founders' emotional authenticity and reports of their relationship with each co-founder. Thus, every participant was both a “rater” (providing data on the independent variable of suppression) and a “rator” (providing data for their co-founders on the remaining study variables of perceived emotional authenticity, relationship viability, frequency and significance of negative events). When ratings of perceived emotional authenticity and relationship viability came from more than one co-founder⁷, we selected only those ratings provided by the co-founder who reported she or he worked most closely with the ratee.

Independent Variable: We measured the independent variable, self-reports of suppression of negative emotions, with three items from the Emotion Regulation Questionnaire (ERQ) (Gross & John, 2003) on a scale from 1 = “Strongly disagree” to 7 = “Strongly agree”: “Thinking about the obstacles you listed before, how much do you agree with the following statements: I down-played my emotional reactions; I kept my emotions to myself; I tried not to express my negative emotions.” The Cronbach's alpha of the measurement was 0.70. To

⁷ For two respondents, we had ratings from four co-founders; for 20 respondents we had ratings from three co-founders; for 22 respondents we had ratings from two co-founders; and for 39 respondents we had ratings from one co-founder.

assess the psychometric properties of the scale, we also performed a factor analysis. Factor loadings based on principal component analysis (PCA) with both Varimax and Promax rotations were above and equal to 0.69 (eigenvalue of 1.89 and 62.96% variance explained).

Dependent Variable: We measured the relationship viability as dependent variable with seven items, adapted to the round-robin structure of the questionnaire, from Resick, Dickson, Mitchelson, Allison, & Clark (2010). Each co-founder evaluated each item on a scale from 1 = “Strongly disagree” to 7 = “Strongly agree,” including for example, “I really enjoy working in a team with [name]” and “I wouldn’t hesitate to start another venture with [name].” The Cronbach’s alpha for the scale was 0.88. The results from PCA factor analyses supported a single-factor solution with both Promax and Varimax rotation (eigenvalue of 4.59 and 65.53% variance explained). Individual items’ loadings on the single factor are greater than 0.66..

Mediator: As in Study 1, we measured perceived emotional authenticity as a mediator with a single item: “Thinking about the obstacles you listed before, how much do you agree with the following statement: [Name]’s emotional reactions were authentic (true to him/herself)” (Impett et al., 2012; Le & Impett, 2013).

Moderators: After completing the independent variable and the mediator, we asked participants two questions about the negative events (i.e., obstacles, faced by their ventures). The first moderator variable measured frequency: “How often does this venture experience obstacles, threatening its success?” (1 = “Never” to 6 = “Daily”). The second item measured significance: “How would you rate the significance of the obstacles, experienced by this venture?” (1 = “Not at all significant” to 5 = “Very significant”).

Controls: We also included several control variables, all measured as self-reports. We measured *gender* (1 = Male; 2 = Female) of the regulator, because research suggests there are gender differences in the ways people regulate their emotions (Timmers, Fischer, & Manstead, 1998), as well as in the way others expect them to regulate their emotions (e.g., men are expected to suppress more than women) (Butler et al., 2007). We included *entrepreneurial experience*, *education* and *age* as indicators of entrepreneurial human capital (Gimeno et al., 1997; Kato & Honjo, 2015; Kim, Aldrich, & Keister, 2006) because entrepreneurial human capital affects many new venturing outcomes (Davidsson & Honig, 2003), including co-founders’ perceptions (Watson, Stewart, & BarNir, 2003). We measured age as a continuous variable in years, education as a categorical variable indicating the highest level of education completed, and entrepreneurial experience as the number of new ventures in which the founder previously had been involved. We controlled for *involvement*, that is, the number of months the regulating founder had been involved in the current venture (using a log transformation, due to high skewness). It indicated the length of time the co-

founders had known each other; the longer they had known each other, the less likely their relationship would have been affected by suppression (Wang & Groth, 2014). Finally, to ensure compatibility with Study 1, in which all participants were management students, we controlled for *educational background* in business-related subjects (binary variable, 1 = Business background and 0 = Other subjects) (Breugst & Shepherd, 2017).

4.8 Study 2: Results and discussion

4.8.1 Hypotheses testing

The collected data have a hierarchical structure (respondents nested in ventures), so to determine the appropriate analytical procedure, we tested for the potential non-independence of responses using a multilevel analysis. The results showed no significant between-group variance in relationship viability or perceived emotional authenticity, which suggested that venture-level variance did not explain a significant portion of variance in the variables of interest, likely because we had only two participants per venture for more than half of the ventures in the study. This low average venture size limited the power for testing random slope variances at the venture level, that is, between-venture variances of effects of individual-level variables and the reliability of estimating those characteristics at the venture level (Snijders, 2005). Therefore, we analyzed the data at the individual level, ignoring its nested structure. Table 4.4⁸ contains the descriptive statistics.

We also followed recommendations by Spector & Brannick (2011) to show explicitly how the addition of control variables affected the observed relationships of interest; Tables 4.5 and 4.6 report the results from analytical models without and with the control variables. By first running the models without the control variables, we also could compare the results from Study 2 with the results from the experimental data from Study 1.

We tested H1b, predicting that suppression predicts relationship viability indirectly, through perceived emotional authenticity, using the SPSS macro PROCESS (Model 4) with 10,000 bootstrap repetitions (Hayes, 2012). We found no direct effect of suppression of negative emotions on perceived emotional authenticity ($\beta = -0.02$, $t = -0.24$, $p = 0.84$) but a significant positive effect of perceived emotional authenticity on relationship viability ($\beta = 0.16$, $t = 2.12$, $p < 0.05$). Therefore, the indirect effect of suppression on relationship viability through perceived emotional authenticity was non-significant ($\beta = -0.01$; [BCa 95% CI]: [-0.08, 0.05]), and we cannot confirm H1b.

8 We calculated the interrater agreement (i.e., intraclass correlation [ICC] for each co-founder; because of the low agreement (ICC for perceived emotional authenticity = 0.41; ICC for relationship viability = 0.11), we decided to keep the data obtained from one co-founder only. We selected the co-founder who indicated that she or he worked most closely with the rater. As a robustness check, we performed all analyses with measurements based on averaging the data obtained from all available co-founders. The results remained similar.

Table 4.4 Means (M), Standard Deviations (SD) and Pearson Correlations of Study 2 Variables

| | <i>M</i> | <i>SD</i> | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-------------------------------------|----------|-----------|------|-------|--------|-------|-------|-------|--------|-------|-------|-------|
| (1)Suppression | 3.60 | 1.18 | 0.04 | -0.03 | -0.05 | 0.01 | -0.10 | 0.10 | -0.05 | 0.06 | -0.08 | 0.13 |
| (2)Relationship viability | 6.36 | 0.75 | | 0.23* | -0.23* | -0.06 | 0.03 | -0.09 | 0.22* | 0.01 | -0.04 | -0.18 |
| (3)Perceived emotional authenticity | 5.64 | 1.02 | | | 0.13 | 0.21 | -0.06 | 0.01 | 0.02 | -0.07 | 0.09 | -0.04 |
| (4)Events' frequency | 3.63 | 1.02 | | | | 0.01 | -0.09 | -0.11 | -0.04 | -0.03 | 0.08 | -0.04 |
| (5)Events' significance | 3.60 | 0.97 | | | | | 0.10 | 0.06 | 0.10 | -0.05 | 0.05 | 0.20 |
| (6)Gender | 1.14 | 0.35 | | | | | | 0.18 | 0.01 | 0.17 | 0.01 | 0.06 |
| (7)Age | 30.55 | 4.81 | | | | | | | 0.34** | 0.09 | -0.08 | 0.15 |
| (8)Ent experience | 1.22 | 1.43 | | | | | | | | -0.16 | 0.06 | -0.20 |
| (9)Education | 5.72 | 1.06 | | | | | | | | | 0.14 | 0.07 |
| (10)Education background (business) | 0.33 | 0.47 | | | | | | | | | | -0.11 |
| (11)Involvement | 1.23 | 0.34 | | | | | | | | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

Hypotheses 2a and 2b predicted moderated mediation effects of the suppression of negative emotion with the frequency and significance of negative events on relationship viability through perceived emotional authenticity. We tested these hypotheses simultaneously, using Model 9 from the PROCESS macro (Hayes, 2012) (see Table 4.5).

In line with our predictions, we found a significant negative moderated mediation effect of the suppression of negative emotion on relationship viability through perceived emotional authenticity, in conditions marked by a high frequency of negative events ($\beta = -0.04$; [BCa 95% CI]: [-0.14, -0.01]). However, the moderated mediation analysis showed that the indirect effect of the suppression of negative emotion on relationship viability via perceived emotional authenticity was not moderated by the significance of negative events ($\beta = 0.01$; [BCa 95% CI]: [-0.04, 0.04]). Therefore, we found support for H2a but not H2b.

Then we ran the models with the control variables. Table 4.6 reports the results, which remained similar in size, direction and significance; the moderated mediation effect of the suppression of negative emotion on relationship viability through perceived emotional authenticity in conditions of high frequency of negative events was negative and significant ($\beta = -0.05$; [BCa 95% CI]: [-0.14, -0.01]). The moderated mediation effect of the suppression of negative emotion on relationship viability through perceived emotional authenticity when the negative events are highly significant was non-significant ($\beta = -0.01$; [BCa 95% CI]: [-0.05, 0.03]).

Table 4.5 Moderated Mediation Model of Indirect Effect of Suppression and Perceived Emotional Authenticity on Relationship Viability Moderated by Frequency and Significance of Negative Events. Study 2

| | | <i>Perceived Emotional Authenticity</i> | | <i>Relationship Viability</i> | |
|---------------------|---|---|----------------------------|---|-------------------------------|
| | | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Direct effects | Constant | 5.62 | 0.11 | 5.50 | 0.42 |
| | Suppression | -0.02 | 0.09 | 0.04 | 0.06 |
| | Perceived emotional authenticity | | | 0.16* | 0.07 |
| | Events' frequency | 0.15 | 0.11 | | |
| | Events' significance | 0.20 | 0.11 | | |
| | Suppression*Frequency | -0.28* | 0.11 | | |
| | Suppression*Significance | 0.01 | 0.10 | | |
| | | $R^2 = 0.14; F(5, 77) = 2.42, p < 0.05$ | | $R^2 = 0.06; F(2, 80) = 2.40, p = 0.10$ | |
| Interaction effect | | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit</i> | <i>Boot Upper Limit 95%CI</i> |
| | Suppression | -0.01 | 0.02 | -0.08 | 0.05 |
| Moderated mediation | | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit</i> | <i>Boot Upper Limit 95%CI</i> |
| | Suppression*Frequency via Perceived emotional authenticity | -0.04 | 0.04 | -0.14 | -0.01 |
| | Suppression*Significance via Perceived emotional authenticity | 0.01 | 0.02 | -0.04 | 0.04 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

4.8.2 Discussion

With Study 2, we show that when ventures face many obstacles, founders' self-reports of habitual suppression of negative emotions relate negatively to co-founders' perceptions of emotional authenticity and perceptions of emotional authenticity relate positively to self-reports of relationship viability. We failed to show that obstacles' significance also moderates the indirect effect of suppression on relationship viability through perceived emotional authenticity. Overall, as new venture are established, the suppression of negative emotions leads to a decrease in relationship longevity and satisfaction, due to decreased authenticity perceptions in settings marked by high-frequency negative events.

4.9 General discussion

In this study, we aimed to test whether holding back of negative emotions is detrimental to establishing satisfactory, lasting relationships as a result of fostering others' perceptions of emotional inauthenticity. In a zero-acquaintance context, perceivers who observe targets

Table 4.6 Moderated Mediation Model of Indirect Effect of Suppression and Perceived Emotional Authenticity on Relationship Viability Moderated by Frequency and Significance of Negative Events (with Controls). Study 2

| Direct effects | <i>Perceived Emotional Authenticity</i> | | <i>Relationship Viability</i> | | |
|---|---|--|-------------------------------|---|--|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> | |
| Constant | 5.76 | 1.01 | 6.42 | 0.79 | |
| Suppression | -0.04 | 0.10 | 0.07 | 0.06 | |
| Perceived emotional authenticity | | | 0.16* | 0.07 | |
| Events' frequency | 0.14 | 0.11 | | | |
| Events' significance | 0.21 | 0.12 | | | |
| Suppression*Frequency | -0.29* | 0.11 | | | |
| Suppression*Significance | -0.01 | 0.10 | | | |
| Gender | -0.25 | 0.33 | 0.15 | 0.22 | |
| Age | 0.02 | 0.02 | -0.03 | 0.02 | |
| Ent experience | -0.02 | 0.09 | 0.09 | 0.05 | |
| Education | -0.03 | 0.11 | 0.02 | 0.07 | |
| Education background (business) | 0.19 | 0.24 | -0.08 | 0.16 | |
| Involvement | -0.20 | 0.34 | -0.40 | 0.22 | |
| | | $R^2 = 0.16; F(11, 71) = 1.20, p = 0.30$ | | $R^2 = 0.17; F(8, 74) = 1.92, p = 0.07$ | |
| Indirect effect | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit 95%CI</i> | <i>Boot Upper Limit 95%CI</i> | |
| Suppression | -0.01 | 0.02 | -0.08 | 0.05 | |
| Moderated mediation | <i>Coefficient</i> | <i>Boot Standard Error</i> | <i>Boot Lower Limit 95%CI</i> | <i>Boot Upper Limit 95%CI</i> | |
| Suppression*Frequency via Perceived emotional authenticity | -0.05 | 0.03 | -0.14 | -0.01 | |
| Suppression*Significance via Perceived emotional authenticity | -0.01 | 0.02 | -0.05 | 0.03 | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

who suppress, rather than express, their negative emotional expressions perceive suppressors to be less emotionally authentic and are consequently less interested in affiliating with the suppressors in comparison to expressers. However, we failed to find support for this indirect effect in the new venture creation context. Instead, in the new venture creation context, suppression lowers perceived emotional authenticity *only* as the frequency of negative events faced by the ventures increases. Perhaps one of the reasons for our finding that self-reported habitual suppression leads to lower emotional authenticity perceptions only for co-founders in ventures who are experiencing a high frequency of negative events is that suppression occurred rigidly, without sensitivity to the venture settings (Butler et al., 2007).

Overall, our findings suggest that the suppression of negative emotions is a potentially harmful emotion regulation strategy with regard to initiating viable working relationships

between potential co-founders. When it comes to sustaining viable working relationships between actual co-founders, the detrimental consequences of suppressing negative emotions depend on the settings in which the co-founders observe that suppression.

4.9.1 Theoretical implications

Although research shows that emotions influence social interactions (Doern & Goss, 2014), current entrepreneurship research lacks theoretical and empirical insights into the social function of emotions during new venture creation. We contribute to literature on the role of emotions in entrepreneurship by introducing the EASI model (Van Kleef, 2009) as a theoretical lens to understand the relationship between founders' emotion regulation and their co-founders' perceptions and interpersonal outcomes. This study is particularly concerned with the social functions of response-focused regulation of negative emotions. Unlike positive emotions, such as hope, optimism and passion – the expression of which has well-established social benefits for founders of new ventures (Anglin et al., 2018; Davis, Hmieleski, Webb, & Coombs, 2017; Li, Chen, Kotha, & Fisher, 2017) – negative emotions are far less understood. We demonstrate that, particularly in a zero-acquaintance context, the suppression versus expression of negative emotions is linked to negative social consequences. The suppression of negative emotion can be socially damaging, as it prevents initiation of viable relationships between co-founders. By including the notion of emotion regulation in the emotion-laden social interactions of entrepreneurs (Brundin et al., 2008), we may understand better how entrepreneurs can leverage emotion in their attempts to build relationships with significant others (Tamir, 2016; Zott & Huy, 2007).

This study also contributes to research on multi-founder new ventures (Klotz et al., 2014; O'Toole et al., 2002; Powell & Baker, 2017) by introducing perceived emotional authenticity as a determinant of co-founders' relationship viability (Foo et al., 2006). Authenticity is a relatively unexplored construct in entrepreneurship literature; our limited knowledge falls under the conceptualization of subjective feelings of authenticity (Conger, McMullen, Bergman, & York, 2018; O'Neil & Ucbasaran, 2016) that indicates the activation of personal identities (Hitlin, 2003). As such, current understanding of authenticity pertains to literature on identity, which dominates the entrepreneurship field (Fauchart & Gruber, 2011; Mathias & Williams, 2014; Powell & Baker, 2014; 2017). In contrast, this study employs a social-constructivist perspective (Peterson, 2005) to introduce the construct of perceived emotional authenticity as a mechanism of the emotion-driven dialogical process between co-founders of new ventures. We suggest that emotional authenticity signals what is important to people. Thus, perceptions of emotional inauthenticity damage the intentions of potential co-founders to work together; they also lower actual co-founders' satisfaction from working together and intentions to continue working together. Perceptions of authenticity in other domains of emotional experiences (i.e., emotional reactions to success) might be predictive of co-founders' relationships too.

Finally, our results also extend the generalizability of the EASI model to an

entrepreneurship field setting by showing that the model's premise is applicable to expressive suppression of new venture founders' negative emotions. Previous research has investigated the EASI model in various contexts in which emotion expression has functional roles, such as conflict and negotiation to instigate resolution behavior (Van Kleef & Dreu, 2010), leadership to inspire and influence followers' performance (Wang & Seibert, 2015) and teaching to shape students' learning performance (Van Doorn, Van Kleef, & Van der Pligt, 2014). Our findings make a novel contribution, in that they show that the tenets of the EASI model may be generalized to the social function of relationship building between equals in real, not-yet-established ventures. Furthermore, we contribute to the EASI model by showing that perceivers attend to the meaning of one's emotion, even if the expression of this emotion is suppressed. Only one previous study has investigated the EASI model as it relates to emotion regulation strategies: Wang & Groth [2014] investigate the principles of the EASI model during customer service interaction. Our study not only details how the negative emotion suppression of founders influences co-founders' perceptions and behavioral intentions, but it also shows how the new venturing context itself influences such perceptions. We find that the relationship between the suppression of negative emotions and co-founders' perceptions of emotional authenticity depends on the frequency of negative events faced by the new venture. This contextual dependency is theoretically grounded in both the EASI model (Gardner et al., 2009) and the framework of entrepreneurial experience (Morris et al., 2012).

4.9.2 Practical Implications

This study has several practical implications. First, it suggests that founders who are currently searching for or trying to attract co-founders for their new ventures and who tend to suppress their emotions, will have more difficulty than non-suppressors forming relationships with co-founders. Any potential interventions directed toward relationship building should address emotion suppression. To initiate and sustain relationships, it is important to be perceived by potential co-founders as emotionally authentic. Thus, expressing rather than suppressing negative emotions is a recommended strategy.

Second, there are implications for new venture teams that have been established and seek to remain together. To ensure the viability of their relationships (i.e., co-founders remain together and are satisfied by working together), co-founders should pay close attention to the way founders deal with difficult times. The more obstacles ventures face, the more open founders need to be about their negative emotional experiences if they want to maintain their image of authenticity. Sharing negative emotions in new venture teams not only strengthens the relationships among co-founders but also alleviates the emotional burden on individual team members, such that "shared pain is half the pain" (Van Kleef & Fischer, 2016, p. 8).

Third, this study offers practical directions for entrepreneurship educators and supporters who design interventions for novice and experienced venture founders and co-founders. It

has become interestingly common for co-founders to attend counseling to learn how to maintain their relationships (Nowell, 2017). Practitioners who offer such services should pay close attention to records of negative emotional events and the resulting founders' behaviors, perceptions and interpersonal outcomes.

4.10 Limitations and further research

This study has several limitations that indicate opportunities for research. To begin with, it investigates the role of emotional processes in entrepreneurship as subjective elements in social judgment and interpersonal behavior; however, it examines only one type of social relationship relevant to the new venture creation, that is, relationships between venture founders. Although a viable relationship between co-founders is predictive of future venture performance (Foo et al., 2006; Kamm, Shuman, Seeger, & Nurick, 1990; Klotz et al., 2014), other important social interactions remain pertinent. The suppression of negative emotions, though detrimental to relationships between co-founders, could be beneficial to relationships between suppressing founders and investors, mentors, business angels and other stakeholders. Furthermore, employees of new ventures are another interesting and important social group that requires further investigation. How new venture employees perceive founders who suppress versus express their negative emotions could have important implications for employees' satisfaction and engagement with the ventures.

Furthermore, different emotion regulation strategies affect peoples' emotional experiences and emotional expressions (Gross, 2002), yet we focus on just one possible response-focused emotion regulation strategy (suppression) and juxtapose it with an alternative strategy (expression) (Kalokerinos et al., 2014). Other emotion regulation strategies should be investigated to clarify how emotion regulation affects social outcomes during new venture creation. For example, a lack of emotion expression could result from the use of antecedent-focused strategies such as reappraisal (Kalokerinos, Greenaway, & Denson, 2015). Previous research indicates that reappraisal is more beneficial than suppression for both intrapersonal and interpersonal outcomes (John & Gross, 2004). It would be interesting to investigate how suppression compares to reappraisal in terms of its influence on perceptions of new venture founders.

Finally, we do not include positive emotion suppression or expression in our design. We focus on the suppression and expression of negative emotions, because previous research has stressed the importance of negative emotions for informing entrepreneurial outcomes (Breugst & Shepherd, 2017; Foo et al., 2009). Unlike negative emotions, positive emotions are personally and interpersonally beneficial (Fredrickson & Branigan, 2005; Impett et al., 2014). However, the expression of positive emotions may not be appropriate in all situations (Kalokerinos, Greenaway, & Casey, 2017). In situations that threaten the survival of ventures, the suppression of positive emotions, unlike negative emotions, may be beneficial

to relationships between co-founders, due to social perceptions about the appropriateness of suppressing or expressing positive emotions in such instances. The field could benefit from further research that explores the perceived emotional authenticity of positive emotion expression and suppression. For example, expressions of entrepreneurial passion that lead to many positive outcomes (Chen et al., 2009) may be perceived as emotionally inauthentic if they are inconsistent with co-founders' expectations (Campellone & Kring, 2013; Hecht & LaFrance, 1998; Kifer, Heller, Perunovic, & Galinsky, 2013; Maringer, Krumhuber, Fischer, & Niedenthal, 2011; Van Knippenberg & Van Kleef, 2016).

4.11 Conclusions

This article adds emotion regulation to the set of interpersonal outcomes in entrepreneurship. It provides insights into the social function of expressive suppression of negative emotions in initiating and sustaining viable relationships between new venture co-founders. In two studies, we show that suppression relates negatively to perceived emotional authenticity and hinders relationships between both potential co-founders and actual co-founders who face obstacles that threaten the success of their ventures. We conclude that founders suffer from suppressing their negative emotions as they give impressions of inauthenticity to co-founders.



CHAPTER 5

Discussion

5.1 Synopsis

Creating new ventures is a lengthy, turbulent and uncertain journey. As entrepreneurs navigate through the journey of venture creation, they engage in many entrepreneurial actions. There are actions located in each phase of the venture creation from pre-launch through execution and development, to post-launch. Through the three chapters of this thesis I have demonstrated the psychological underpinnings and consequences of entrepreneurs' actions at each phase of the new venture creation process. As such, this thesis increases understanding about the micro-foundations of new venture creation and provides important step toward opening the black box between individual psychological constructs and new venture creation outcomes. Furthermore, this thesis introduces contextual moderators, which enable a link between the entrepreneur and his or her environment.

Grounded in action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014), this thesis made a significant contribution toward a more fine-grained investigation of the key actions associated with each phase of new venture creation (Baron, 2007; Gorgievski & Stephan, 2016). Underneath each of the research questions that were investigated laid an underlying assumption: that entrepreneurship research concerns itself with distinctive ways of feeling, thinking and behaving. By applying theories and constructs from psychology and embedding this thesis in action-characteristics model of entrepreneurship, I could address this assumption more directly and more profoundly in comparison to early entrepreneurship research which used proxies to study the emotions, decisions and actions of entrepreneurs solely as predictors of entrepreneurial performance.

This final chapter summarizes and discusses the main conclusions and insights derived from the three empirical studies presented in Chapters 2, 3 and 4. The chapter further presents key theoretical and practical implications and highlights directions for future research.

5.2 Summary of findings and insights

5.2.1 Key findings and insights from Study 1

Study 1 focused on the pre-launch phase of a new venture. The most crucial decision in this phase is to identify an opportunity for new venture creation, which will bring them to desired end state successfully. This phase is both emotionally heated and cognitively demanding as the positive and negative emotions associated with finding or coming up with a good opportunity (e.g., excitement and/or fear) coincide with the cognitive challenges of judging the value and the feasibility of an opportunity under conditions of uncertainty. Therefore, in this study I focused on the link between emotion and cognition that concerns opportunity desirability and feasibility beliefs as distinctive entrepreneurial micro-foundations. I found evidence that desirability and feasibility beliefs are distinctive

but interconnected constructs. Furthermore, the results demonstrated that desirability can be predicted by positive and negative emotions such as anger, fear and happiness through cognitive appraisal of controllability. These results extend the current literature on entrepreneurial cognition (Baron & Ward, 2004; Grégoire et al., 2011) and provide new insights into the cognitive-emotional underpinnings of entrepreneurial action (Baron, 2008).

5.2.2 Key findings and insights from Study 2

During the execution and development phase of a new venture, entrepreneurs engage in a number of actions to refine their business concept and acquire resources (Frese & Gielnik, 2014; Shepherd et al., 2007). How to behave and what actions to undertake during this phase are challenging questions for entrepreneurs because not all of their attempts will result in profitable ventures. In this phase, entrepreneurs decide if they continue the new venture creation to eventually transition to the growth phase or if they disengage. Hence, disengagement or continuation is a crucial decision in this phase. Moreover, if entrepreneurs decide to stop pursuing venture creation, they need to do so with minimal loss of resources including their time. Paradoxically, however, disengaging from unprofitable ventures takes more time than establishing profitable ones (Hechavarría et al., 2016; Shim & Davidsson, 2018). Therefore, in this study I argued that entrepreneurial actions have psychological consequences, which would enable or disable entrepreneurs to disengage as soon as possible from the creation of futile ventures. The results showed that increasing engagement in prediction-focused actions lowers the time to disengagement from new ventures and greater undertaking of control-focused actions increases the time to disengagement. Moreover, I took into account the context of the country, in which the entrepreneur is creating a new venture and found that uncertainty avoidance moderates the association between control-focused actions and time to disengagement such that under conditions of higher uncertainty avoidance increased engagement in control-focused actions decreases the time to disengagement. Unlike previous research, which showed how prediction and control-focused decision logics affect entrepreneurial growth, profitability and survival (Brinckmann et al., 2010; Dew, Read, et al., 2009; Wiltbank et al., 2006), this study investigated the effects of prediction and control-focused actions and their relationship with the unique new venture outcome of disengagement.

5.2.3 Key findings and insights from Study 3

Study 3 focused on a further phase of the new venture creation process. In the post-launch phase of a new venture, entrepreneurs act to ensure the survival and viability of the venture. Being still relatively early in the firm development, the survival of the venture is dependent on the viability of the team behind it (Alvarez et al., 2007). In this study I focused on the co-founders' relationship viability as a micro-foundation of new venture creation, which is both affective-laden and driven by cognitive perceptions. I showed that founders who

suppress the expression of their negative emotions are perceived as emotionally inauthentic. Subsequently, emotional authenticity was found to be an important predictor of co-founders' relationship viability. These findings are among the first empirical evidence of the emotional and cognitive antecedents to initiating and sustaining viable relationships between co-founders of new ventures.

5.3 Theoretical implications

Individually, each of the three studies provided new insights into the theories that explain the roles of emotions, decisions and actions in informing micro-foundations of the new venture creation process. Beyond the specific contributions outlined in each of the three studies, there are some general contributions toward the field of psychology of entrepreneurship and the action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014) in particular.

First, I make a contribution toward the action-characteristic model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014) by introducing new psychological mechanisms underpinning entrepreneurial actions. Findings of this thesis enable a better understanding of the mechanisms behind intrapersonal and interpersonal effects of emotions and emotion-related processes. Understanding the intermediary mechanisms behind the role of psychological constructs allows entrepreneurship scholars to be more precise in answering the *why* and *how* questions about entrepreneurial action. For example, I showed that distinct emotions and emotion-related processes trigger cognitive mechanisms, which in turn influence important micro-foundations of new venture creation such as formation of opportunity beliefs and establishing viable relationship between co-founders. Therefore, I make an important advancement to examine the black box between emotions and emotion-related inputs and entrepreneurial decisions and actions (Chen et al., 2009; Grichnik et al., 2010; Podoyntsina et al., 2012). Although providing empirical evidence for the mechanisms behind previously observed direct effects is a difficult task, which requires richer datasets and more sophisticated methodologies, it is an important task for further developments of theory on psychology of entrepreneurship.

Second, this thesis contributes to the action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014) by introducing a novel association between entrepreneurial action and disengagement from new venture creation. The role of entrepreneurial action as a fundamental building block in the creation of new ventures has become integral to current understanding of entrepreneurial performance and success (Arenius et al., 2017; Autio et al., 2013; Klein, 2008; McMullen & Shepherd, 2006). However, the potential outcomes of the new venture creation process are more than just success. At each phase of the new venture creation process, entrepreneurial actions can lead to a successful transition to the next phase, but they can also lead to withdrawing

to a previous phase or leaving the new venture creation process altogether. Therefore, it is important to further extend the action-characteristics model of entrepreneurship to predict a wider range of outcomes. An important contribution I make in this directions is introducing the notion that psychological constructs not only influence entrepreneurial action but may also be influenced by entrepreneurial action.

Third, this thesis contributes to action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014) by incorporating contextual dependencies on the relationships between psychological constructs and entrepreneurial action, as well as on the relationships between action and new venture creation outcomes. According to the current account of the action-characteristics model, environmental factors play a moderating role on the relationship between actions and new venture creation success outcomes, as well as directly influence entrepreneurial action. In addition, this thesis showed evidence that the environment also impacts the relationship between psychological constructs and entrepreneurial actions. Individuals who act on entrepreneurial opportunities to create a new venture do so in various contexts. Understanding the psychology of entrepreneurship is, therefore, impossible without understanding the role of context at the individual level. Therefore, I make an important extension to previous research, which investigated the effects of individual-level psychological constructs in isolation from the context in which new ventures are being created.

5.4 Practical implications

This thesis also provides some meaningful insights for entrepreneurs, for support providers of entrepreneurial activity as well as for entrepreneurial educators.

To begin with, I offer implications for entrepreneurs engaged in new venture creation process. At different phases of venture creation, entrepreneurs need to complete different actions such as selecting an opportunity to pursue, getting together a team to act upon the selected opportunity and in some cases, ceasing opportunity pursuit. Based on the findings of this thesis, I derive important insights for managing one's emotions (De Cock et al., 2017; Fang He et al., 2018), monitoring one's decisions (Felin & Zenger, 2009; McKelvie et al., 2011) and actions (Autio et al., 2013; Reynolds, 2016b). Specifically, (i) entrepreneurs should be aware of the emotionally-laden nature of their judgments, (ii) they should continuously and actively re-evaluate the viability of their ideas through the development and execution phase of venture creation and when appropriate, (iii) entrepreneurs should not shy away disengaging from an unprofitable venture sooner rather than later, (iv) entrepreneurs should strive for emotional authenticity in the presence of their co-founders and (v) entrepreneurs should bear in mind that their perceptions play a role in the choice of commencing to work and continuing to work with a co-founder.

Furthermore, this thesis also has implications for entrepreneurial supporters, in particular those dedicated to providing social support to individual entrepreneurs and/or teams (Kim et al., 2013). These supporters, such as mentors, counselors, friends and family need to recognize the phase-specific action, which entrepreneurs need to perform, and provide phase-relevant support. For example, if an entrepreneur is struggling to select between potential opportunities, his/her mentors can bring attention to the different aspects of opportunity judgment, i.e., desirability and feasibility, to enable the entrepreneur to make a decision based on his/ her own personal beliefs. Later on, if an entrepreneur is considering disengagement and ceasing pursuit of a venture, friends and family should be mindful of the hardship of this decision and support the entrepreneur who takes this decision after having performed significant amount of relevant execution and development actions. Finally, mentors and counselors can help entrepreneurs adopt the most efficient emotion regulation strategies, which will yield promising and productive working relationships.

Finally, this thesis provides implications for entrepreneurship educators, who are preparing future entrepreneurs to successfully create new ventures. As suggested by Shepherd (2004), educators should focus on students' feeling and emotions and their consequences for entrepreneurial decisions and actions. Entrepreneurship educators should direct students' attention to phase-specific entrepreneurial actions important for new venture creation such as forming opportunity beliefs, disengaging and establishing viable relationships. Being aware of these actions during the entrepreneurial journey, future entrepreneurs will be better prepared to embrace the entrepreneurship journey with a more realistic perspective.

5.5 Limitations and directions for future research

Each of the empirical studies presented in this thesis concludes by pointing toward its limitations and providing suggestions for further research. Beyond these, there are some general limitations and avenues for future research that can be derived from the thesis. I will conclude this thesis by pointing out the overall limitations of the thesis and suggesting new research opportunities for scholars in the fields of entrepreneurship and industrial and organizational (I/O) psychology.

To begin with, this thesis was limited to investigating individual-level emotional, cognitive and behavioral constructs underpinning the micro-foundations of entrepreneurship. In reality, new ventures are often created by multiple founders who experience emotions, make decisions and perform actions together rather than in isolation. For example, at a team-level the identification of a desirable and feasible opportunity can be influenced by interpersonal mechanisms linking group emotions with the formation of opportunity beliefs (e.g., Intergroup Emotion Theory (Mackie, Devos, & Smith, 2000)). In addition, group emotions (Mackie, et al., 2000) play an important role in sustaining collective action, which could also result in longer persistence with the development and execution stage of venture

creation and further delay in team-level disengagement outcome. Although, in Study 3 I moved the individual-level focus of this thesis towards the social context of new venture founding teams, more research is needed to extend current psychology-based research in entrepreneurship from individual to team and organizational level. Therefore, a particularly promising avenue for future research is to investigate the difference between individual-level and team and organizational-levels indirect effects of psychological constructs on new venture creation outcomes through entrepreneurial action.

Second, as this thesis was embedded in the action-characteristics model of entrepreneurship (Frese, 2009; Frese & Gielnik, 2014), it focused on investigating entrepreneurial actions during different phases of new venture creation. Therefore, a general limitation of this thesis is that actual venture performance was not part of its scope even though in entrepreneurship research venture performance represents the ultimate (desired) outcome (Dimov, 2007). Therefore, future research could relate the phase-specific entrepreneurial actions to venture performance. For example, formation of opportunity beliefs is one of the most quintessentially entrepreneurial action but to date there is no research investigating how entrepreneurs' opportunity beliefs predict future performance. Furthermore, it will be interesting to explore which opportunity belief, desirability of feasibility, is more strongly related to venture performance. Answering this can have important implications for entrepreneurs whose desirability and feasibility beliefs are misaligned and for entrepreneurs who are struggling to choose between many available opportunities. Although disengagement can be seen as preventive of achieving venture performance in the first instance, it might have a positive effect on the performance of other ventures for portfolio entrepreneurs. Future research can shed light on the overall career success of entrepreneurs who disengage from one of their ventures. Finally, relationship outcomes are assumed to be predictive of venture performance, however, empirical evidence to support this assumption is still limited. Future research needs to explore further the boundary conditions of co-founders' relationship for ensuring positive performance outcomes over time. A viable relationship might be important in early phases of new venture creation, but it could also have a later detrimental effect as innovation performance decreases (Balkundi & Harrison, 2006).

Third, this thesis focused on one particular stage of entrepreneurship – new venture creation. All three studies answered research questions addressing the micro-foundations of each phase of new venture creation. Even Study 3, positioned in the post-launch phase of a venture, targeted ventures in entrepreneurial centers, incubators and accelerators that were still in an early stage of development (Breugst & Shepherd, 2017). The context of this early stage venture creation, characterized with uncertainty, ambiguity and risk (Knight, 1921), lends itself to the influence of various psychological factors of emotional, cognitive and behavioral nature. However, as ventures become more established, there are more actions entrepreneurs need to engage in, related to the growth of the firm in size (Cardon, 2003), sales and profit (Tveterås & Eide, 2000) and innovation (Alegre & Chiva, 2013).

Addressing these entrepreneurial actions from a psychological perspective is an important direction for further research.

Finally, this thesis is located in the intersection of entrepreneurship and psychology but its main contributions are limited to the field of entrepreneurship. Nevertheless, entrepreneurship is an interesting context for studying theories and constructs coming from particular disciplines within psychology, such as I/O psychology. In comparison to managers, who are traditionally the target participants in I/O psychology research, entrepreneurs experience much higher emotional stimulation from the work they are involved in because of high identification with their ventures (Cardon et al., 2005) and because of high uncertainty of the work (Hayton & Cholakova, 2012). Furthermore, entrepreneurial teams, unlike top management teams, are formed by individuals who choose each other as teammates (O'Toole et al., 2002) and whose relationship often extends beyond their ventures as many co-founders are family members, life partners and friends. Thus, applying theories from I/O psychology to the entrepreneurial context can enable scholars to establish the boundary condition of key tenets within these theories, which is an important goal of theory development (Bacharach, 1989). In turn both disciplines, I/O psychology and entrepreneurship, can mutually benefit from well-developed and widely tested theories.

5.6 Concluding remarks

As a lengthy, turbulent and uncertain journey, the creation of new ventures generates substantial emotions, requires time-bound decisions and involves the undertaking of many different types of action. At the same time, no venture could ever be created without an individual, who believes that a given opportunity is desirable and feasible, who persistently performs actions until a profitable venture is created or abandoned and who manages to sustain satisfactory relationships with their co-founders. This thesis investigated an array of psychological constructs, on emotional, cognitive and behavioral level, and their impact on important outcomes during new venture creation. In doing so, I made important advancements in building knowledge on the psychology of entrepreneurship and called for future research to continue the investigation of entrepreneurial individuals and their emotions, decisions and actions.



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APPENDIX

Appendix 1

Appendix 1.1 Results from pre-test of emotion induction

| Measured emotions | <i>Induced emotions</i> | | | | | | | |
|-------------------|-------------------------|-----------|-----------------------|-----------|----------------------------|-----------|--------------------------|-----------|
| | Anger (<i>N</i> = 29) | | Fear (<i>N</i> = 30) | | Happiness (<i>N</i> = 34) | | Neutral (<i>N</i> = 32) | |
| | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> | <i>Mean</i> | <i>SD</i> |
| Anger | 2.64 | 1.22 | 1.79 | 0.73 | 1.49 | 0.52 | 1.54 | 0.51 |
| Fear | 1.81 | 0.90 | 2.42 | 1.51 | 1.84 | 0.77 | 1.42 | 0.59 |
| Happiness | 2.60 | 1.23 | 2.51 | 1.09 | 3.71 | 0.75 | 2.27 | 0.98 |

* *Wilks* $\Lambda = .44$, $F(9, 289.77) = 13.09$, $p < 0.001$, $\eta^2 = 0.24$. All effect sizes (Cohen's *d*) of post hoc comparisons are medium to very large, between 0.48 and 1.65.

Appendix 1.2 Description of entrepreneurial opportunity

Please imagine that you are in the following situation:

- You are interested in starting your own business given the right business opportunity.
- A business opportunity means to bring into existence a new product or service to be launched in either an existing or a new market.
- You are aware that start-ups in the area have recently received investment from venture capital firms.
- As a student you are in the position to start a business which may not generate income in its first period.
- Starting your own business would bring you significant tax benefits.

Keeping these points in mind, please read the Business Opportunity described below. Later you will be asked some questions about it.

Business Opportunity Description

Recently you attended a presentation at the university campus where you have heard a group of researchers announcing the identification of a business opportunity to commercialize a recently developed technology. This new technology, called Logic PLS, would revolutionize temperature control in retail supply chain management.

Market Need

Food products in retail stores need to be of good quality to be sold. In order to maintain this quality, retail supply chain management is critical. Supply chain management has several dimensions, one of which is the need for monitoring and maintaining appropriate temperatures. Temperature monitoring and control currently requires various components, technologies and expensive manual labour. Therefore, retailers are looking for long-term solutions which will lower the costs of temperature control and improve the efficiency of their supply-chain.

Technological Innovation

To meet the need of the retailers, researchers from your university have developed and patented Logic PLS. Logic PLS is a new design of microchips printed on plastic foil. Specialists consider Logic PLS as an extremely novel extension of current microchip technology. Current microchips on plastic foils have limited memory to store and communicate data via radio-frequent signal (for example tags used on products' packaging for tracking purposes). The new microchip design allows microchips on plastic foil to integrate sensors for collecting data. Therefore, tags on product packaging improved with the Logic PLS microchip design can be now used to monitor and maintain temperature. This reduces components and technologies required and decreases manual labour needed for temperature control. Considering that retailers are already using tags on the packaging of their products and systems for radio-transmission of data in their supply-chain management, implementing Logic PLS could be done with small to moderate costs and would not require significant investments. As result, significant cost saving and improved efficiency could be achieved.

Business Opportunity

The university researchers are looking for entrepreneur(s) willing to start a new venture to produce microchips with the new Logic PLS design and sell them to retailers to address their need for a lower cost temperature control solution. Logic PLS would provide a problem-based solution to the large and constantly growing retail market. A preliminary market study was positive, indicating that the risk of the microchips not being adopted by the retailers is low. This also increases expectations that a new venture exploiting this business opportunity will quickly break even and generate positive cash flows and profits.

Appendix 1.3 Generating measures of opportunity desirability and feasibility beliefs

We used the definitions of desirability and feasibility that we derived from the entrepreneurial action model and construal-level theory to develop an initial list of 13 items based on Grégoire et al.'s scale (2009) (see Table 1.3.1). Grégoire et al. (2009) include a third factor,

Table 1.3.1 Overview of Initial 13 Items

| <i>Construct</i> | <i>Items</i> |
|---------------------------------|---|
| Opportunity desirability belief | Exploiting this business opportunity appeals to me. Successful exploitation of this business opportunity will adequately fulfil my personal desires. Applying Logic PLS in the targeted market is a desirable business opportunity for me. Applying Logic PLS in the targeted market constitutes a profitable business opportunity for me. The RFID market has the size and the money for me to profit from the application of Logic PLS. Exploiting this business opportunity is worth the efforts for me. |
| Opportunity feasibility belief | I believe that I have the knowledge needed to exploit this business opportunity successfully. I can successfully apply Logic PLS to address the needs of the target market. Applying Logic PLS in the targeted market constitutes a feasible business opportunity for me. I find Logic PLS sufficiently developed to be able to apply it in the targeted market. I am confident that I can perform the tasks necessary to achieve a successful exploitation of this opportunity. I should attempt to apply Logic PLS in the target market. I have the skills and abilities to proficiently exploit this business opportunity. |

“degree of alignment between focal means of supply and target market,” that is not appropriate for our study. We tested these 13 items with a sample of 28 students from the same Dutch university, who were not part of the main study, as well as six entrepreneurship academic experts and five entrepreneurs. The results from substantive validity pre-test indicated the best performing items (see Appendix 1.4).

Substantive validity implies that a measure reflects and is theoretically linked to the focal construct (Holden & Jackson, 1979). In the substantive validity pre-test, we asked all 39 participants to assign the 13 items to a desirability or a feasibility concept. Following recommendations from Anderson & Gerbing (1991), we calculated the proportion of substantive agreement (psa) and substantive validity coefficient (svc) for each item. The proportion of substantive agreement refers to the proportion of respondents who assign an item to its intended construct (Anderson & Gerbing, 1991). The substantive validity coefficient reflects the extent to which respondents assign an item to its posited construct more than to any other construct (Anderson & Gerbing, 1991).

Appendix 1.4 Results from substantive validity pre-test of desirability and feasibility

Table 1.4.1 Results from Substantive Validity Pre-test

| <i>Factor</i> | <i>Item</i> | <i>PSA</i> | <i>SVC</i> |
|--|--|------------|------------|
| Opportunity desirability belief | Exploiting this business opportunity appeals to me. | 0.61 | 0.42 |
| | *Successful exploitation of this business opportunity will adequately fulfill my personal desires. | 0.82 | 0.66 |
| | *Applying Logic PLS in the targeted market is a desirable business opportunity for me. | 0.82 | 0.66 |
| | *Applying Logic PLS in the targeted market constitutes a profitable business opportunity for me. | 0.82 | 0.66 |
| | The RFID market has the size and the money for me to profit from the application of Logic PLS. | 0.73 | 0.47 |
| | Exploiting this business opportunity is worth the efforts for me. | 0.61 | 0.42 |
| Opportunity feasibility belief | *I believe that I have the knowledge needed to exploit this business opportunity successfully. | 0.79 | 0.61 |
| | I can successfully apply Logic PLS to address the needs of the target market. | 0.71 | 0.42 |
| | *Applying Logic PLS in the targeted market constitutes a feasible business opportunity for me. | 0.76 | 0.53 |
| | *I find Logic PLS sufficiently developed to be able to apply it in the targeted market. | 0.76 | 0.55 |
| | *I am confident that I can perform the tasks necessary to achieve a successful exploitation of this opportunity. | 0.79 | 0.61 |
| | I should attempt to apply Logic PLS in the target market. | 0.50 | 0.02 |
| I have the skills and abilities to proficiently exploit this business opportunity. | 0.68 | 0.39 | |

* Items with highest PSA and SVC used in the main study.

Appendix 2

Appendix 2.1 Data cleaning procedure

First, we removed 411 participants because they were unavailable for follow-up interviews and we could not observe the outcomes of disengagement. We removed an additional 560 participants because they reported undertaking fewer than three actions during the period of observation. We assumed that such ‘dilettante dreamers’ (Davidsson & Gordon, 2012; Parker & Belghitar, 2006), ‘hobbyists’ (Reynolds & Curtin, 2008) or ‘dabblers’ (Carter et al., 1996) were not devoting time and effort to establishing their venture; given that they were ‘never really very likely to amount to anything’ (Parker & Belghitar, 2006, p. 96); including such an inactive group of participants may have caused misleading results and model misspecification. We further removed 51 participants because they had more than 12-month gaps between any two actions they had undertaken, again indicating low commitment. We removed 5 more participants because their reported dates of disengagement were earlier than their ventures’ conception dates. (We set conception date as the date of the first action of two actions, undertaken by the entrepreneur within a 12-month period [Reynolds & Curtin, 2011]). We removed additional 38 participants because they reported disengaging from their ventures before being screened into the PSED study (in any of the cohorts), suggesting that their responses were entirely retrospective. We removed these participants from the data set following a delayed entry procedure (as explained previously). Finally, we removed 33 more participants because the conception date of their venture was more than 10 years before the initial data-collection point. In this case, we questioned the accuracy of the information provided by the respondents (LeBrasseur et al., 2003; Yang & Aldrich, 2012).

Appendix 2.2 Results from substantive validity pre-test

We conducted a substantive validity pre-test to indicate how well each of the 16 actions reflected the constructs of prediction and control. This pre-test included an initial sample of 22 participants; of these, 10 academic experts in the field of entrepreneurship and 12 entrepreneurs identified with the question: ‘Are you, alone or with others, currently the owner of a business you help manage, including self-employment or selling any goods or services to others?’ Three of the entrepreneurs reported they were not primarily responsible for the decision-making and ongoing operations of their ventures; we removed them from

Table 2.2.1 Results from Substantive Validity Pre-test

| | <i>Control</i> | | <i>Prediction</i> | |
|---|----------------|------------|-------------------|------------|
| | <i>PSA</i> | <i>SVC</i> | <i>PSA</i> | <i>SVC</i> |
| Investment of own money | 0.79* | 0.58 | 0.21 | -0.58 |
| Business planning | 0.16 | -0.68 | 0.84* | 0.68 |
| Defining markets to enter | 0.37 | -0.26 | 0.63* | 0.26 |
| Development of model, prototype | 0.79* | 0.58 | 0.21 | -0.58 |
| Creating financial projections | 0.11 | -0.79 | 0.89* | 0.79 |
| Purchase of materials, supplies, parts | 0.53 | 0.05 | 0.47 | -0.05 |
| Promotion of products or services | 0.58 | 0.16 | 0.42 | -0.16 |
| Leasing, acquiring major assets | 0.53 | 0.05 | 0.47 | -0.05 |
| Listing the venture in a phone book | 0.47 | -0.05 | 0.53 | 0.05 |
| Obtaining supplier credit | 0.47 | -0.05 | 0.53 | 0.05 |
| Working full-time (35+ hours a week) on the venture | 0.89* | 0.79 | 0.11 | -0.79 |
| Organizing venture team | 0.79* | 0.58 | 0.21 | -0.58 |
| Acquiring business registration number | 0.47 | -0.05 | 0.53 | 0.05 |
| Hiring an employee | 0.68* | 0.37 | 0.32 | -0.37 |
| Asking for formal funding | 0.26 | -0.47 | 0.74* | 0.47 |
| Filing for patent, copyright, trademark | 0.37 | -0.26 | 0.63* | 0.26 |

N = 19. * Items with highest PSA and SVC.

the sample, reducing the final number of respondents to 19. This sample size is comparable to other studies that have used a similar approach to categorize PSED actions (e.g., Brush et al., [2008] collected data from 16 experts and Chen et al. [2018] used a similar item-sorting procedure with 10 experts).

Substantive validity implies that a measure reflects and is theoretically linked to the focal construct (Holden & Jackson, 1979). In the substantive validity pre-test, we asked all participants to assign the 16 PSED actions to a prediction or control concept. Following recommendations from Anderson & Gerbing (1991), we calculated the proportion of substantive agreement (*psa*) and substantive validity coefficient (*svc*) for each item. The proportion of substantive agreement refers to the proportion of respondents who assign an item to its intended construct (Anderson & Gerbing, 1991). The substantive validity coefficient reflects the extent to which respondents assign an item to its posited construct compared to any other construct (Anderson & Gerbing, 1991). Based on results from our substantive validity study, we identified the actions that best reflected prediction-focused behavior and those that best reflected control-focused behavior. In line with Anderson & Gerbing's suggestion, we used the validity coefficients in a comparative manner and retained the items yielding the largest coefficients for each construct.

Appendix 3

Appendix 3.1 Pre-test of film clip

We conducted a pre-test to test the film clip that we used to induce negative emotions in the laboratory experiment in Study 1. A Mechanical Turk (MTurk) sample of 44 participants (54.5% men, average age 20.91 years, $SD = 1.82$) participated. Five participants were removed from the sample because they failed to answer two control questions at the end of the experiment correctly, which were designed to verify that they had actually watched the film. The experimental procedure involved three steps:

1. Participants completed a set of self-report scales of negative emotions: fear, anger and sadness, PANAS-X (Watson & Clark, 1994), anxiety present and anxiety absent, from STAI (Marteau & Bekker, 1992) and tension, from POMS (Albrecht & Ewing, 1989).
2. Participants were randomly assigned to watch one of two film clips: either the experimental video ($N = 20$) or a neutral video ($N = 19$).
3. Participants completed the same self-report scales of emotions and demographic questions.

The Cronbach's alpha of all scales (pre- and post-experimental induction) showed high internal reliability, between 0.89 and 0.96.

We took film clips for both the experimental and neutral conditions from the film *Ratter* (2015), about a young graduate student who is tormented by a stalker who hacks into her electronic devices and monitors her every move. The experimental video clip includes scenes of the stalker coming into the student apartment; at the end of the film clip, the stalker appears to kill or kidnap the student. The total duration of this clip is about 10 minutes in length. The neutral-condition film clip includes scenes of the student's daily routines: cooking, exercising, going to university and studying. It is about 7.5 minutes in length.

We conducted a repeated-measure multivariate analysis of variance (MANOVA) to confirm the increase in negative emotions as a result of watching the experimental film clip. The pre- and post-film emotion self-report is the within-subject factor and the experimental condition (experimental vs. neutral film clip) is the between-subjects factor. The results indicate a significant interaction effect of pre- and post-measure/condition for fear $F(1, 37) = 5.63, p < 0.05, \eta^2 = 0.13$; anger $F(1, 37) = 5.12, p < 0.05, \eta^2 = 0.12$; tension $F(1, 37) = 6.48, p < 0.05, \eta^2 = 0.15$; anxiety present $F(1, 37) = 6.90, p < 0.05, \eta^2 = 0.16$; and anxiety absent $F(1, 37) = 5.35, p < 0.05, \eta^2 = 0.13$. However, there is no significant interaction effect of pre- and post-measure/condition for sadness $F(1, 37) = 3.95, p = 0.06, \eta^2 = 0.10$.

Table 3.1.1 Results from Pre-test of Film Clip

| | <i>Experimental condition</i> | | <i>Neutral condition</i> | |
|---------------------------|-------------------------------|-----------|--------------------------|-----------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| <i>Pre-film measures</i> | | | | |
| Fear | 1.43 | 0.62 | 1.78 | 1.01 |
| Anger | 1.35 | 0.57 | 1.61 | 1.06 |
| Sadness | 1.75 | 1.12 | 1.79 | 1.16 |
| Tension | 1.85 | 0.67 | 2.11 | 0.97 |
| Anxiety present | 1.58 | 0.66 | 1.88 | 0.95 |
| Anxiety absent | 3.23 | 1.05 | 3.03 | 1.08 |
| <i>Post-film measures</i> | | | | |
| Fear | 2.63 | 1.22 | 2.09 | 0.93 |
| Anger | 2.35 | 1.45 | 1.79 | 0.92 |
| Sadness | 2.47 | 1.23 | 1.68 | 0.85 |
| Tension | 3.01 | 0.98 | 2.39 | 0.84 |
| Anxiety present | 2.67 | 1.04 | 2.05 | 0.83 |
| Anxiety absent | 1.92 | 0.98 | 2.49 | 1.16 |

Appendix 3.2 Experimental instructions

Instructions to regulator in suppression condition

We are interested in **how people communicate without using emotional expression**. It is, therefore, extremely important that if you had any feelings as you watched the film, please try your best **not to let those feelings show**. During the entire interaction with your teammate, please try to behave in such a way that **he/she would not know you are feeling anything at all**. That is:

- **Do not express your emotions outwardly**. You keep stoic even when speaking about your feelings regarding the film or any other feelings you may experience during your interaction.
- If you have to talk about your emotions related to the content of the film or later about the decision task, do so by **keeping your face and body emotionless**. For example, you can talk about your initial feelings upon seeing some particular scenes or how you feel emotionally about the topic in general, but **make every effort you can not to use facial expressions, inflections in your voice, or body gestures** to convey those emotions or feelings.
- Make every effort you can to **control your voice or body gestures**. For example, try not to even smile back at your teammate at any point during the conversation and try to remain still and stoic.

To summarize, during your entire interaction with your teammate which includes the film discussion and the decision task, hide your feelings as much as you can.

Your teammate has not received such instructions, please do not share with them that you have been instructed to hide your emotions.

As we are recording your discussion, we will be able to check if you have followed the instructions to hide your emotions during all interactions with your teammate.

When active, press the “**Next**” button to indicate that you understand the instructions.

Instructions to regulator in expression condition

We are interested in understanding **how people communicate their emotions to one another**. It is, therefore, extremely important that if you had any feelings as you watched the film, please try your best to **let those feelings show**. During the entire interaction with your teammate, please try to behave in such a way that he/she can easily tell what you are feeling. That is:

- Use **expressive gestures** and facial expression to convey your feelings regarding the film or any other feelings you may experience during your interaction.
- **Talk about your emotions** related to the content of the film and later about the decision task. **Emphasize these feelings with gestures/expressions**. For example, you can talk about your initial feelings upon seeing some particular scenes or how you feel emotionally about the topic in general.
- Make every effort you can to **use the tone of your voice or body gestures** to convey those emotions or feelings. For example, **try to use nonverbal signals** to convey your specific emotional state to your teammate during the conversation and **use facial cues likes nods or smiles** to let your teammate know you understand what they’re saying.

To summarize, during your entire interaction with your teammate which includes the film discussion and the decision task, show your feelings as much as you can.

Your teammate has not received such instructions, please do not share with them that you have been instructed to show your emotions.

As we are recording your discussion, we will be able to check if you have followed the instructions to show your emotions during all interactions with your teammate.

When active, press the “**Next**” button to indicate that you understand the instructions.

Instructions to target in suppression and in expression conditions

We are interested in **the communicative processes that allow people to understand each other**. Next, you will have the opportunity to **discuss the film with your teammate**. During your interaction with your teammate, please **try to interact normally**. It is important for the sake of this study that **you pay attention to the emotional expressions of your teammate**. During the entire interaction with your teammate, please try to observe:

- Your teammate’s use of **expressive gestures** and **facial expression** to show or hide their feelings.
- **How does your teammate talk about their emotions** related to the content of the film and later about the decision task.



Note: Picture adapted for experimental use from Ekman & Friesen (2003)

- Your teammate's **tone of voice**.
- **The presence or absence of nonverbal signals** during the conversation.

To summarize, during your entire interaction with your teammate which includes the film discussion and the decision task, pay attention to the emotional expressions of your teammate as much as you can.

Pay close attention to subtle expressions of emotions. For example, photo B shows a man experiencing fear compared to photo A, where he is in a neutral emotional state. Did you notice that the only difference between the two facial expressions is in his eyebrows!?

Appendix 3.3 Opportunity selection scenario

Please imagine that you and your teammate are the two co-founders of a new venture. You both have equal shares in the venture and equal say in making any venture-related decisions.

Your new venture develops and commercializes an innovative technology, called *CamShield*. *CamShield* ensures the privacy and security of cameras and microphones when using Internet-connected devices (e.g., computers, tablets, phones). *CamShield* monitors

the processes that use the camera and microphone feed buffer. If a malicious process is identified, *CamShield* blocks it from trying to access one's camera or microphone.

Your thorough market research and financial projections has led you to identify two potential market opportunities. The two opportunities require similar and manageable levels of start-up capital and have the same target for return on investment (ROI).

Please read the descriptions of the two opportunities below.

Opportunity 1. Security software for consumers.

Nowadays every Internet-connected personal device - PC, smartphone, tablet – has a camera and a microphone. Camera and microphone hacking is a serious and increasingly common cyber-crime. Hackers gain access to cameras and microphones to record, analyse, abuse and share one's private data. This data shows people's activities, location and personal details. Cyber stalking, cyber blackmail, industrial espionage, theft and trespassing are often the result of hacking one's camera or microphone. Therefore, consumers are looking for a solution which will ensure their privacy and security when using their Internet-connected devices.

CamShield can meet the needs of the consumers. Specialists consider *CamShield* as an extremely novel and valuable extension to the existing security software for consumers. Current solutions do not offer dedicated anti cam or mic-spyware application and have limited capabilities in making accurate decisions if processes are malicious or not. The unique selling point of *CamShield* is the implementation of an access control system that determines which process is allowed to utilize camera and microphone.

The prime task of this new venture will be designing and selling the software to consumers to address their needs for privacy and security when engaging with Internet-connected devices. *CamShield* would add a problem-based solution to the large and constantly growing consumer security software market.

Opportunity 2. Security software for camera and microphone manufacturers.

Manufacturers of computer hardware, such as cameras and microphones, have been increasingly urged to take countermeasures to hacking to ensure the privacy and the security of their products. Leading industry experts suggest that computer hardware manufacturers should improve the security of their products, by adding security software to the devices themselves and their control applications and make communication protocols more strict. For these reasons, manufacturers of cameras and microphones are looking for a solution which will ensure the security of their products.

CamShield can meet the needs of the manufacturers. As software installed onto the microphones and cameras during their production, *CamShield* can address the very core of the issue, by monitoring and controlling camera resource (buffer feed) access in a very direct and hard to circumvent way. Specialists consider this to be an extremely novel and valuable extension to existing software for cameras and microphones. The unique selling point of *CamShield* software is the implementation of a raw-data-traffic level control system that reliably detects malware access to cameras and microphones.

The prime task of this new venture will be designing and selling the software to manufacturers of cameras and microphones to address their need to remain competitive by ensuring the security of their products. *CamShield* offers a problem-based solution to the large and constantly growing market of computer hardware manufacturing.

For each scale below, kindly circle the number which you feel best assesses the amount of RISK associated with the opportunity:

| <i>Opportunity 1</i> | | | | | | | | <i>Opportunity 2</i> | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|----------------------|--------------|---|---|---|---|---|---|---|------------------|
| HIGH RISK | 1 | 2 | 3 | 4 | 5 | 6 | 7 | LOW RISK | HIGH RISK | 1 | 2 | 3 | 4 | 5 | 6 | 7 | LOW RISK |
| MINIMAL RISK | 1 | 2 | 3 | 4 | 5 | 6 | 7 | EXTREME RISK | MINIMAL RISK | 1 | 2 | 3 | 4 | 5 | 6 | 7 | EXTREME RISK |
| VERY RISKY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | NOT RISKY AT ALL | VERY RISKY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | NOT RISKY AT ALL |

Next, indicate which opportunity you, as the venture founding team, would choose. Please mark your choice by circling one of the two opportunities:

| <i>Opportunity 1</i> | | | | | | | | <i>Opportunity 2</i> | | | | | | | |
|----------------------|--|--|--|--|--|--|--|----------------------|--|--|--|--|--|--|--|
|----------------------|--|--|--|--|--|--|--|----------------------|--|--|--|--|--|--|--|

Appendix 3.4 Alternative explanation. Study 1

Table 3.4.1 Direct, Indirect and Total Effects of Suppression and Opportunity Desirability on Relationship Viability

| | <i>Opportunity Desirability</i> | | <i>Relationship Viability</i> | |
|--|---|-------------------------|---|----------------------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Direct effects | | | | |
| Constant | 4.50 | 0.46 | 55.30 | 9.01 |
| Suppression | -0.35 | 0.28 | -5.12 | 3.75 |
| Opportunity desirability | | | 3.12* | 1.50 |
| Regulator gender | 0.34 | 0.28 | -6.29 | 3.77 |
| | $R^2 = 0.03; F(2, 77) = 1.23, p = 0.30$ | | $R^2 = 0.12; F(3, 76) = 3.50, p < 0.05$ | |
| Indirect effect | <i>Boot Lower Limit</i> | <i>Boot Upper Limit</i> | <i>Coefficient</i> | <i>Boot Standard Error</i> |
| | <i>95%CI</i> | <i>95%CI</i> | | |
| Suppression via Opportunity desirability | -0.09 | -0.03 | -0.11 | 0.01 |
| Total effect | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Constant | | | 69.37 | 6.12 |
| Suppression | | | -6.23 | 3.79 |
| Regulator gender | | | -5.22 | 3.82 |
| | $R^2 = 0.07; F(2, 77) = 2.95, p = 0.06$ | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.

Table 3.4.2 Direct, Indirect and Total Effects of Suppression and Opportunity Feasibility on Relationship Viability

| | <i>Opportunity Feasibility</i> | | <i>Relationship Viability</i> | |
|---|---|-------------------------|--|----------------------------|
| | <i>Coefficient</i> | <i>Standard Error</i> | <i>Coefficient</i> | <i>Standard Error</i> |
| Direct effects | | | | |
| Constant | 4.21 | 0.41 | 45.31 | 8.75 |
| Suppression | -0.47 | 0.25 | -3.55 | 3.60 |
| Opportunity feasibility | | | 5.71*** | 1.58 |
| Regulator gender | 0.27 | 0.26 | -6.76 | 3.57 |
| | $R^2 = 0.05; F(2, 77) = 1.91, p = 0.15$ | | $R^2 = 0.21; F(3, 76) = 6.64, p < 0.001$ | |
| Indirect effect | <i>Boot Lower Limit</i> | <i>Boot Upper Limit</i> | <i>Coefficient</i> | <i>Boot Standard Error</i> |
| | <i>95%CI</i> | <i>95%CI</i> | | |
| Suppression via Opportunity feasibility | -0.08 | 0.05 | -0.19 | 0.01 |
| Total effect | | | <i>Coefficient</i> | <i>Standard Error</i> |
| Constant | | | 69.37 | 6.12 |
| Suppression | | | -6.23 | 3.79 |
| Regulator gender | | | -5.22 | 3.82 |
| | $R^2 = 0.07; F(2, 77) = 2.95, p = 0.06$ | | | |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, two-tailed test.



SUMMARY

Emotions, Decisions, Actions: The Psychology of Entrepreneurship

The potential benefits of increased entrepreneurial activity are numerous. Entrepreneurship boosts worldwide economic growth, increases employment and decreases poverty. Through fostering new venture creation, entrepreneurship in the USA produced 46 percent of the private non-farm GDP in 2008, accounted for more than 89 percent of the employers in 2016 and gained the largest amount of new jobs, 1.1 million net jobs, in 2018 (data from the USA Small Business and Entrepreneurship Council, 2018). Furthermore, entrepreneurship raises the productivity of existing firms and industries through innovation, knowledge spillovers and increased competition. Such worldwide, national and industry-level benefits can all be attributed to the creation of new ventures by an individual or a group of individuals to produce value for customers and workers. The factors associated with new venture creation success can be located at multiple levels: individual, organisational, industry, national economic and political environment. However, entrepreneurship is fundamentally a personal undertaking (Baum et al., 2007) and it is the entrepreneurs' actions that both external investors and the entrepreneurs themselves recognise as the most important factor for new venture creation success.

Since, psychology has dedicated itself to study of human behavior, it makes sense to turn to psychology to investigate such important categories of entrepreneurship research such as the individual actions undertaken in pursuit of a new venture creation (Frese, 2009). Using a psychological perspective to investigate the entrepreneurship phenomena, this thesis builds upon the action-characteristics model of entrepreneurship (Frese, 2009). The three empirical studies in this thesis investigate entrepreneurial actions, central to the main phases of the new venture creation process. Namely, these phases are (1) pre-launch; (2) development and execution; and (3) post-launch (Baron, 2007). The structure of the thesis follows the order of these phases and Chapter 2 is positioned in the pre-launch phase, Chapter 3 investigates action particular to the development and execution phase and finally, Chapter 4 is set in the post-launch phase.

In each of those three phases individual psychological constructs such as personality, motivation, education, and cognition play important role (Frese & Gielnik, 2014). However, these psychological constructs do not affect new venture success directly but only indirectly through their influence on the particular action of the specific phase. This premise of the action-characteristics model gives the prime motivation for the individual studies of this thesis. Furthermore, this thesis contributes to the development of the action-characteristics model as it offers new insights on psychological underpinnings and consequences of actions, as well as introduces novel evidence on the role of context.

In the first phase of pre-launch, the most important actions performed by entrepreneurs relate to the opportunity identification and development. Entrepreneurs who come up with a business idea have to modify, shape, and refine the idea such that it becomes a desirable and feasible opportunity for the entrepreneur him/herself (Dimov, 2007). Therefore, Chapter

2 investigates an action central for the pre-launch phase, i.e., formation of first-person desirability and feasibility opportunity beliefs. In order to bring light on the formation of desirability and feasibility opportunity beliefs, this study proposes and finds evidence of distinctive cognitive-emotional paths that lead to formation of opportunity desirability and opportunity feasibility beliefs. In particular, findings from the experimental study ($N = 191$) show that desirability can be predicted by basic emotions such as happiness, anger and fear through cognitive appraisal of controllability. This study is the first to investigate cognitive mechanism of the effect of emotions on a specific entrepreneurial action. It is also the first to separate the ways of which entrepreneurs construct desirability and feasibility beliefs, thus, bringing new insight on the psychological foundations of opportunity beliefs formation during the pre-launch phase of new venture creation.

In the second phase, entrepreneurs have to perform several actions to establish their ventures (Frese & Gielnik, 2014). Such actions are for example acquiring the necessary resources (defined in Chapter 3 as a control-focused actions) and verifying business concept (defined in Chapter 3 as prediction-focused actions). The actions that entrepreneurs perform in this phase have important consequences for the future success of the venture. In Chapter 3, I propose that the prediction and control-focused actions, undertaken by the entrepreneur also inform an important new venture outcome of disengagement, in particular the time that entrepreneurs take until they disengage from their ventures. In line with the action-characteristics model (Frese, 2009; Frese & Gielnik, 2014), this study also includes country-level uncertainty avoidance as a moderating variable. Findings from an event-history analysis of 1748 entrepreneurs who were actively engaged in new venture creation show that the more predictive actions entrepreneurs take, the shorter their time to disengagement is. In contrast, the more control-focused actions they undertake, the longer their time to disengagement, however, this relationship is dependent on the country-level of uncertainty avoidance and it only holds under conditions of low level of uncertainty avoidance. This chapter aims to navigate entrepreneurs during the development and execution phase of new venture creation and it sheds light on a new potential outcome of engaging in entrepreneurial action.

In the third phase of post-launch, entrepreneurs have to take the necessary action to manage survival and growth of the new venture. Considering that most new ventures are created by entrepreneurial teams rather than entrepreneurial individuals, an important action in this phase is establishing long-lasting and productive relationships with the members of the entrepreneurial team (Baron, 2007). Therefore, Chapter 4 investigates the actions of initiating and building viable relationships between co-founders of new ventures. Using a social-functional theory of emotions, this chapter demonstrates evidence that co-founders are more likely to initiate and sustain a viable relationship when they perceive each other's emotional expressions as being authentic. This evidence is collected through a combination of laboratory experiment with management students and a field survey of new venture co-founders. Chapter 4 introduces a novel interconnection between

negative emotion and cognition which explains how new venture co-founders establish viable relationships. It also demonstrates that characteristics of the new venture creation context have moderating effects. This chapter extends the action-characteristics model of entrepreneurship as it introduces novel underlying mechanisms of entrepreneurial action as well as a novel role of context as a moderator in the relationship between psychological constructs and entrepreneurial action.

Finally, Chapter 5 summarizes the main findings and implications of the studies described in previous chapters of this thesis. Though each study has been conducted and written separately and intended to be readable outside of the context of this thesis; the three studies put together trace an entrepreneur's personal journey of new venture creation. Collectively, the studies shed new light on the important actions performed by entrepreneurs at the main phases of their journey. Subsequently, general conclusions regarding the contributions of the studies to action-characteristics model of entrepreneurship are given in Chapter 5.



CURRICULUM VITAE

Stela Ivanova was born on the 29th of December, 1987 in Kazanlak, Bulgaria. After finishing the National School for Ancient Languages and Cultures in 2006 in Sofia, Bulgaria, she completed a bachelor degree in Psychology at Sofia University in 2010 and a master degree in Organisational Psychology at City University, London, the UK in 2012. Between the years of 2012 and 2014, Stela was employed as a Research Project Coordinator at Thomas International in London, the UK. From September 2014 she started a PhD project at Technical University of Eindhoven in the Netherlands of which the results are presented in this thesis. More specifically, her research uses psychological perspectives to address research questions relevant to the main phases of the entrepreneurial process. During her PhD project, Stela completed a three-month research visit at University of New South Wales in Sydney, Australia. She has presented her work at numerous international conferences and has her first academic publication in *International Small Business Journal*.

