A motivational perspective to decision-making and behavior in organizations

A motivational perspective to decision-making and behavior in organizations

Een motiverend perspectief op besluitvorming en gedrag in organisaties

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To Aryan Soren, my one year old bundle of joy

Live a life full of “motivation” and “challenging goals”. I will always believe in your “capabilities”, mommy!

Preface

Wasn't there motivating teachers who had trust in my potentials, I was not where I am now, from Ms. Asadi, the teacher of second grade who looked at the eyes of a 7 year old girl and told that she must become a doctor or engineer to Professor Justin Jansen who gave me an opportunity to switch from Tinbergen Institute to Erasmus Research Institute of Management (ERIM) to follow my research interests in Erasmus University Rotterdam.

At the start of my PhD trajectory, just being back from my first visit of Academy of Management conference, I wanted to run experiments among managers. I was new to complications of experimental methods and the only one in the department who used it at the time. Because of the support of the team of co-authors who encouraged the idea and gave me some room to "experiment" and challenge myself, I could submit a full paper in the first months based on those experiments. It took three years for my first paper to get published and I needed to collect much more data but I gained a lot by learning from them and also through learning-by- doing in each submission.

Colleagues, family, friends, and institutes supported and inspired me in the past couple of years. I am indebted to the advisory team who became role models for me in different ways. I had the opportunity to learn hypothesis development from one of the most highly cited scholars in management research while he was correcting the logic in my texts. Wasn't it a luxury for a PhD student? If the current version of the papers do not show that, I try to prove it better in years to come. In the first meeting, Justin told me to "be an entrepreneur in research" and encouraged me to become one. He taught me to be pragmatic about research and simplified my complex vague models, texts, and even thoughts. Being a person high in both prevention and promotion foci, I benefitted from the fit of the supervisory team and

motivational vacillations in the context. With his optimal delegation of authority, he gave me the freedom to experiment with several different research topics and data collections, and tolerated my trials even at the times I got so independent that I submitted papers based on my own judgement without his approval. As such, each time, I became more motivated to work harder to show him that I can "discern" those ideas that are" fruitful" from "futiles". I was always waiting eagerly for the moment to share with him some good news. Luca, with his unique emotional intelligence and support, was a treasure. He was there to push the shy and cautious side of me forward once he knew me. He knew how to ask the most important fundamental questions in the beginning of the research and challenged me to think and express better what I am going to do. I am also thankful to Saeed Khanagha for encouragements in the initial steps, and his support in collecting data for the second chapter. I benefited from Tom Mom's prior research and he was kind enough to join the advisory team in later stages of my PhD trajectory.

To JP Eggers and department of Management and Organization in Stern School of Business- I am grateful, for their exceptional attention and support that facilitated my research visit at the difficult time of the travel ban. The opportunity to visit Stern and know and learn from JP closely was invaluable. He was always there to think out of the box and suggest more interesting research questions or hypotheses about my research topics. Till now, he has been patiently translating my results and naïve ideas in to something more interesting, beautiful, and meaningful. JP became a role model for me in many aspects and most importantly in the way he cared about juniors and spent time to guide PhD students of the department.

I am thankful to RSM, ERIM and Trustfonds for supporting conference visits, data collection efforts, and the research visit. RSM gave structure and form to my mind for doing management research and NYU Stern showed me the ways

to get out of the structure and look differently at the phenomena when necessary. I could have still done better in this dissertation but years to come are for me to practice these and find my balance.

The colleagues and friends in RSM made the PhD journey more fun. Lance, Rene, and Emre made T7-26 not just a warm bright room but a pleasant comfortable second home. Jacomijn, Thijs, Krishnan, Taghi, Radina, Ilaria, Stefan, Roxana, Joost, Patricia, and many more contributed to shaping a positive atmosphere on 7th floor. The collaboration with Richard and Mallory in the quantitative method course was excellent and memorable.My my new colleagues in Amsterdam Business School have been instrumental in feeling great about academic work while I was following these final steps. I thank Michiel, my new office mate, for his help in writing the Dutch summary of this dissertation and sharing his insights and career development advices.

In the final year of my PhD trajectory, my dream came true and an angle came to my life but of course with some complications. Only then, I learned there is nothing as helpful as the support of a female network when life becomes complicated. They are the only ones who truly understand you and come to everyday life, not only with full support but also with their feminine warmth and compassion, when you need it the most, when you are a new mom trying to finish your thesis, compete in job market, and finish an R&R, when you are still weak and your baby is sick. I have been blessed to have the best of the females beside me. Somayeh, Atena, Nazanin, Mina, and Maryam, thanks for being there for me whenever I asked for. I would never forget those days. Marzieh, Rene, Jacomijn, Patricia, Magdalena, Ana, and Lotte thanks for your hugs and empowering words when I needed them the most.

Not only this dissertation and my education but also my life is affected by the family who showed me what unconditional love is- most importantly a father

who is a true man of wisdom and a mother who is kindhearted. They accepted me the way I was, supported the path I chose, and filled my life with love. Without Saeed's companionship, not only this journey but my life would have been different. During my study, he showed extraordinary skills to help me in some aspects and leave me alone in some challenges in order for me to become very independent. As old friends and classmates, we moved from country to country, school to school, passed ups and downs, and proved that we could both achieve more when we were together. May it long continue.

Saeedeh Ahmadi

5 May 2019 , Amsterdam

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1 Introduction

As organizational tensions have become more salient in the contemporary organizations, scholars increasingly explore their nature, approaches to deal with them, and their impact (Schad et al., 2016). Focusing on efficiency-oriented exploitative activities and attempting to show exploratory behavior or following the future oriented wave of an emerging technology and continuing with the current ones are examples of such tensions that compromise survival and competitiveness of organizations and require managers to deal with high levels of uncertainty in complex decision-making situations.

Most often, attending to both sides is important for the organizations' survival, but they are not always equally important (Puranam et al., 2006). For instance, scholars have suggested that in a rapidly changing environment with high levels of uncertainty the need for internal variety and effective adaptation necessitates an increased focus on exploration (Gupta, Smith, and Shalley 2006; McGrath 2001). However, organizations vary in their ability to cope with inherent challenges of such tensions (Levinthal and March, 1993; March, 1991; Tushman and O'Reilly, 1996) and studies have identified a range of reasons that explain this variation and a key role is played by managers. Notably, managers play an important role in facilitating exploration within organizational boundaries (Gibson and Birkinshaw,

2004; Lubatkin et al., 2006; O'Reilly and Tushman, 2011) but research in this area in limited (Gibson and Birkinshaw, 2004; Gupta et al., 2006; Sitkin et al., 2011).

In this dissertation, I focus on the underlying reasons for specific behaviors and performance under uncertainty in organizations. At the intersection of literature of strategic management and applied psychology, I focus on motivation as a main driver of strategic preferences and behaviors in organizations. Broussard and Garrison (2004) broadly define motivation as "the attribute that moves us to do or not to do something" (p. 106). I combine theoretical arguments from organization and psychological theories to explain managers' decision making about exploration-exploitation trade-off in response to the uncertainties that emerging technologies impose and also to explain exploratory behavior and performance outcomes in response to a motivating intervention through challenging goals. Among many psychological elements that may affect the behavior, I choose motivation because it refers to "the reasons underlying behavior" (Guay et al., 2010, p. 712). It is the important impetus that gives direction to our behavior.

In the first study, I explain how motivational systems shape the decision of the manager in dealing with the complexity that emerging technology imposes. I try to explain the tendency of managers to exploration when they face the different levels of complex decision-making situation that emerging technology brings about, through a psychological perspective. In the second study, I focus on the motivating role of stretch goals as an extrinsic motives which impose tensions, and

investigate their positive and negative roles in encouraging members of service units to get out of their comfort zone, participate and engage in exploratory behavior and generate performance outcomes which translates to intended and unintended outcome for the organization. In the third study, I investigate the preference of the manager for the delay in investment on an emerging technology as a choice which is shaped by his perception of the situation and the stimuli of the context. Decision to invest in new technologies is one of the most important managerial decisions that involves uncertainty, because it involves an upfront commitment of resources to a highly uncertain future outcome which could compromise the competitiveness or the very existence of the firm. I combine motivation and capability lenses to explain how this decision is a consequence of managers' prior decision in reconciling exploration-exploitation trade-off.

1.1 Research Aim

The overall aim of this research is to increase our understanding of how motivation affects the strategic behavior in organizations. The dissertation seeks to uncover key motivational drivers of strategic decisions and to identify the contextual factors that act as boundary conditions to the motivational factors. To do this, the dissertation develops a psychological perspective that considers the significance of motivational and behavioral aspects of managers' decision-making and employee's behavior by using four sets of empirical data in three studies to quantitatively examine the theories. The outcome variables of this dissertation

range from managerial preferences for strategic action to actual innovative output of the individuals in organization. As such, this dissertation makes a clear attempt to identify the effects of motivational factors across organizational levels. Consideration of organizational context with motivational lens is pertinent for understanding the nuances of strategic decision making and behavior. Although the idea that organizational context is an important driver of how motivational factors influence strategic actions seems intuitive, existing research provides little discussion about the combined effects of these factors. Therefore, the research aim of this dissertation are to increase the understanding of how motivation influences strategic behavior and examine the organizational and individual factors that act as boundary condition of the motivational factors in organizations.

In addressing the above objectives, this dissertation seeks a number of important contributions. First, it contributes to the literature on strategic decision-making by providing empirical evidence that how individual characteristics and perception, organizational context, and complexity of decision making interact and in combination determine the strategic preference of decision maker for exploration and timing of investment on emerging technologies. Second, by focusing on emerging technologies and strategic choices that need to be made under conflicting requirements of such technologies, this research advances the scholarly knowledge of organizational response to technological change. I identify a number of previously overlooked factors that determine when and how organizations

engage with a technological change. Finally, we contribute to the literature that discusses the paradoxical nature of stretch goals as motivating levers. We bring together the disparate logics, discuss their behavioral and performance outcomes, separate the intended and unintended results, and describe the individual differences that shape the performance variance in response to such goals.

1.2 Methodologies

This dissertation is based on an empirical approach and uses first hand data. Table 1-1 provides a summary of the studies which I will elaborate further in the following chapters. In providing a micro-level motivational perspective on exploration, study 1 and 3 use experimental methods. Through experimental vignette methodology (EVM), I take exploration-exploitation tradeoff research in a new methodological direction. While micro-level studies in this line of research are still scarce, I try to go one step further and provide a better understanding on not only what makes professional decision makers decide about these trade-offs but also on how they behave the way they do in certain situations. I devised experiments based on a business problem to which the participants could actively relate. Involving business managers helped me to increase the internal validity of the results and to avoid artificial responses in EVM, as recommended by Aguinis and Bradley (2014).

Table 1-1 Summary of the studies

	Study 1	Study 2	Study 3
Data source			
	Experiment among: - 122 managers of a large telecommunication company - 139 master's students in Strategic management program at Rotterdam school of management	A combination of a survey among employees of 102 service units of a fortune 500 company and archival company data including 10,655 employees' output in those units	Experiment among: 104 managers in healthcare industry who are familiar with Internet of Things technology
Year	2014-2016	2015-2018	2016-2018
Unit of analysis	Individual manager Individual student	Individual service employee	Individual manager
Dependent variable	Exploration orientation	Idea generation behavior- participation Idea generation behavior-engagement Fruitful ideas for new business opportunity Futile ideas for new business opportunity	Timing of investment on emerging technology
Independent variables	Regulatory focus trait	Stretch goal	Capability gap perception
Moderators	Regulatory focus context Complexity of decision-making situation	Prior success Organizational tenure Hierarchical position	Regulatory focus context
Mediators	-	-	Exploration

Using students of strategic management as the other sample, I could increase the generalizability of the findings by eliminating the potential effects of the particular

organizational context of our first study. In addition of text vignettes, I used video vignette which are expected to increase the immersion and external validity of the study (Aguinis and Bradley, 2014). In Study 2, I collected multi-source data and combined a time lagged survey and archival company data collected from service units of a large multinational ICT company.

1.3 Outline of Dissertation

This dissertation includes three studies each of which contribute in its own way to the research aim. Each study focuses on different research gaps, and sometimes on different theoretical constructs and levels of analysis which will be explained in the following.

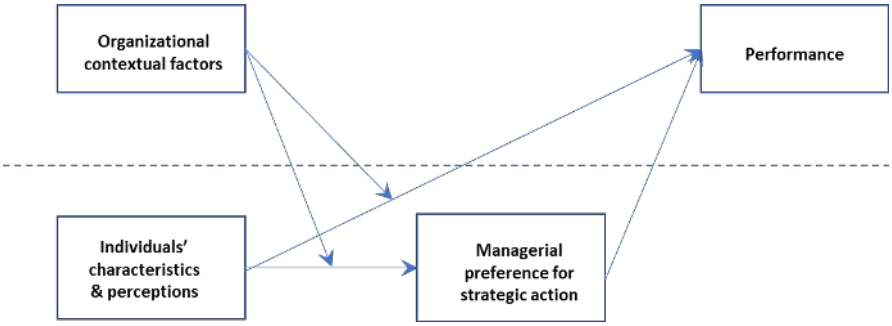
In study 1, drawing on regulatory focus theory (RFT) (Higgins, 1997) as a recent motivation theory, I develop a motivational perspective on exploration orientation of managers in dealing with complexities of decision making about a new technology. It is known that organizations may vary in their ability to cope with the inherent challenges of pursuing exploration and exploitation (Levinthal & March, 1993; March, 1991; Tushman & O'Reilly, 1996), and studies have argued that a key role is played by managers in reconciling exploration and exploitation tradeoffs (Gibson & Birkinshaw, 2004; Lubatkin et al., 2006; O'Reilly & Tushman, 2011). However, research on what steers individual manager for exploration is scarce (Lavie et al., 2010; Laureiro-Mart & Brusoni, 2015), and only a few earlier studies on antecedents of exploration have considered factors

such as cognitive capabilities (Laureiro-Mart & Brusoni, 2015) or access to knowledge flows (Mom et al., 2007; 2015) without a motivation lens. I test my theoretical model which explains how a combination of trait and context shapes manager's decision using an experimental setting. I collect data from two samples, including the managers in a large multinational corporation and master students of strategic management at Rotterdam school of management.

In the second study, I investigate the effect of stretch goals as external motivational triggers that are expected to encourage exploratory behavior of service units to seek new business opportunities out of existing routines. While for many years advocates of stretch goals have argued that such goals can improve performance by stimulating search and innovation, promoting new ways of thinking, and guiding effort and persistence, and there is prevalent anecdotal evidence for this (see Ordóñez et al., 2009; Sitkin et al., 2017), there is still limited evidence to supports such generalizations. Recently, some scholars have put forward some evidence highlighting the disruptive (unethical behavior) or no effects of stretch goals (Zhang and Jia, 2013; Gary et al., 2017). I theorize and provide an empirical investigation on the effectiveness of stretch goals for an interesting form of performance (identification of new business opportunities) which has been neglected before (Gary et al., 2017). To increase our understanding of the nuances of the puzzling nature of stretch goals, I discuss both desirable and undesirable consequences of such goals and the mechanisms that

empower or hinder them. A combination of a time-lagged survey and archival company data in service units of a fortune 500 company is used for this study.

Figure 1-1- An overall conceptual framework



While strategic management literature has extensively used capability lens in describing the variation in strategic choices and behavior, in the third study, I combine motivation and capability perspectives in studying managers' preferences in dealing with the uncertainty that the capability gap imposes based on an emerging technology. This study contributes to recent research agenda that proposes that our understanding of the behavior by looking at ability is incomplete without adding a motivation lens to it (Zhao and Chadwick, 2014, Osterloh and Frey, 2000; Dahlin et al., 2018; Egger and Kaul, 2018). It explains the tradeoffs and pros and cons managers see in early versus late investment and how this is directly and indirectly affected by the way their perception of the gap between current capabilities of the firm and what is requires to be successful in the

emerging technology, and how the motivation shapes their judgements. In one step further than study1, I discuss the consequence of exploration approach in terms of timing of the investment decision. In fact, I show how the approach they choose to close the gap, through exploration or exploitation, indirectly affects their timing of investment in a different way that the direct effect works. I test the theoretical framework using data collected from managers active in health care sector involved with Internet of Things technology. Table 1-2 presents a summary of the literature gaps and the respective contributions. Figure 1-1 provides an overall conceptual framework that is central to the three studies.

Table 1-2 Summary of the main gaps and contributions

Study	Main Gaps	Main contributions
Study 1- A psychological perspective on managers' exploration orientation: the role of regulatory focus, regulatory fit, and complexity.	Organizations may vary in their ability to cope with the inherent challenges of pursuing exploration and exploitation. Despite the critical role played by managers in this regard, our understanding of what makes them more inclined to exploration is limited (Gibson and Birkinshaw, 2004; Gupta et al., 2006; Sitkin et al., 2011; Mom et al., 2015)	with a psychological perspective on preference of managers for exploration, this research shows their orientation toward search, risk-taking, and experimentation is shaped not only by their motivational systems, but also by the fit between their motivational systems and the motivational cues in the context as well as the complexity of the decision-making situation. It provides a micro level perspective to exploration but also it addresses calls to go beyond cognition, and attend to other psychological factors in connection with strategic decision-making (see Hodgkinson & Healey, 2011). Drawing on the idea that complexity may activate self-regulatory systems (Bandura & Jourden, 1991), the study explains how dealing with complexity has important implications not only for managerial preferences but also for managers' receptiveness to motivational cues from the organizational context.
Study 2- Stretch goals and idea generation: one size fits all?	Despite years of advocacy for the motivating positive effects of stretch goals for performance through stimulating search and innovation, promoting new ways of thinking, and guiding effort and persistence, recent scholarly research highlights the disruptive (in form of unethical behavior) or no effects of stretch goals (Zhang and Jia, 2013; Gary et al., 2017) and agrees there is still limited evidence proving the effectiveness of such goals on performance in organizations.	This study provides a more nuanced understanding of the puzzling nature of stretch goals and extends the recent scholarly research that highlight no effect or negative effects of stretch goals (e.g. Gary et al., 2017; Zhang and Jia, 2013; Sitkin et al., 2017) by discussing behavioral and performance outcomes of such goals, speerating intended and unintended results, and suggesting boundary conditions. It indicates that it is too early to decide about the ultimate inefficacy of stretch goals for all types of performance and different individuals. It provides new insights on the performance variance that stretch goals bring about (Gary

		et.al, 2017) and clarifies that they are largely beneficial for those who already possess the potential to discern the desirable outcome from undesirable outcome– based on their previously demonstrated capabilities, their organizational experience, and their level of seniority.
Study 3- Strategizing for emerging technologies- The role of motivation and ability in shaping managers' preferences for timing of investment	Strategic management scholars extensively used capability lens to explain strategic decisions and actions. However, recent scholarship proposes that such understanding behavior by looking at ability is incomplete without adding a motivation lens to it (Zhao and Chadwick, 2014, Osterloh and Frey, 2000; Dahlin et al., 2018; Eggers and Kaul, 2018).	This study is one of a few that combines capability lens with motivation and explains the managerial strategic decisions in response to an emerging technology. It explains the tradeoffs managers see in early versus late investment and how this is directly and indirectly affected by the way their perception of the gap between current capabilities of the firm and what is requires to be successful in the emerging technology, and how the motivation shapes their judgements. It extends the recent work that explain motivation and ability in firms' strategic behavior (Egger and Kaul, 2018) by looking into these influences as an input to the decisions and at the level of individual strategic decision makers.

2 Study 1 - A Psychological Perspective On Managers' Exploration Orientation: The Role Of Regulatory Focus, Regulatory Fit, And Complexity[1]

2.1 Abstract

We develop a psychological perspective on managers' exploration orientation. Our study suggests that the regulatory focus of managers may impact in different ways their orientation toward search, risk-taking, and experimentation, and that these relationships are contingent not only on the extent to which the organizational context fits with the motivational disposition of managers, but also on the complexity of decision-making. Using an experimental setting, we collected data from two independent samples: product managers within a large multinational corporation and business school students. We find that managers' regulatory focus affects their willingness to experiment with alternatives and to take risks. Moreover, the extent to which the promotion focus of individuals demonstrates their exploration orientation is strengthened in an organizational context by promotion-focused cues, and in highly complex decision-making. This study has important implications for our understanding of managers' exploration orientation in large organizations under complexity.

Keywords: Complexity, Exploration, Motivation, Regulatory Focus Theory

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2.1 Introduction

It is almost a truism that organizations need to move beyond exploitative activities by attempting to achieve breakthroughs by means of exploratory behavior. Although both exploration and exploitation are important for an organization's survival, they are not always equally important (Puranam et al., 2006). For instance, scholars have suggested that, in a rapidly changing environment, the need for internal variety and effective adaptation necessitates an increased focus on exploration (Gupta et al., 2006; McGrath, 2001). However, organizations may vary in their ability to cope with the inherent challenges of pursuing exploration and exploitation (Levinthal & March, 1993; March, 1991; Tushman & O'Reilly, 1996), and studies have identified various reasons for this. Importantly, this body of research has argued that a key role is played by managers (Gibson & Birkinshaw, 2004; Lubatkin et al., 2006; O'Reilly & Tushman, 2011). They may facilitate the coexistence of exploration and exploitation by supporting organizational members to move away from existing routines, allocating enough resources, and implementing differentiated organizational structures (Benner & Tushman, 2003; Boumgarden et al., 2012; Markides, 2014). Yet, our understanding of how psychological attributes may impact managers' orientation toward exploration is underdeveloped, and fundamental pieces are missing (Gupta et al., 2006). In fact, despite the critical role played by managers in making decisions about exploration, there is only limited research on what mechanisms may make them more inclined to exploration (Sitkin et al., 2011). Hence, recent

research emphasizes the need to investigate the antecedents of individual-level exploration in organizations (Mom et al., 2015). In this paper, we develop a psychological perspective on managers' exploration orientation, and argue that their orientation toward search, risk-taking, and experimentation is shaped not only by their motivational systems, but also by the fit between their motivational systems and the motivational cues as well as the complexity of the decision-making context. Our principal contributions are threefold.

First, drawing on regulatory focus theory (RFT) (Higgins 1997), we develop a psychological perspective on managers' exploration orientation. Research on individual-level antecedents of exploration is scarce (Lavie et al., 2010; Laureiro-Mart & Brusoni, 2015), and only a few earlier empirical studies in this area have considered factors such as cognitive capabilities (Laureiro-Mart & Brusoni, 2015) or access to knowledge flows (Mom et al., 2007; Mom et al., 2015) without considering motivational factors. In line with research that considers regulatory focus to be a driver of managers' preferences and decision-making (e.g., McMullen et al., 2009), we propose that the regulatory focus of managers – via either a promotion focus (a sensitivity to gains and a desire for advancement and growth) or a prevention focus (a sensitivity to losses and a desire for stability and security) – has an important bearing on their exploratory orientation. By uncovering the overlooked motivational drivers of exploration orientation, we address calls to go beyond cognition, and attend to other psychological factors in connection with strategic decision-making (see Hodgkinson & Healey, 2011).

Second, although earlier research has suggested that regulatory focus may affect strategic actions of decision-makers and leaders' activities in organizations (e.g., McMullen et al., 2009; Tuncdogan et al., 2015), there are still few insights into how organizational conditions and traits may shape the effect of regulatory focus (Lanaj et al., 2012). By using the notion of regulatory fit, we argue that the match between the motivational drivers of individuals and motivational cues provided in the organizational context has important implications for managers' preferences for exploration under complexity. In particular, we discuss how situations in which the emphasis is on gains, advancement, and hope – in contrast to those in which it is on obligations, possible failure, or loss – influence decision-makers differently, depending on their regulatory focus. Moreover, we postulate that such psychological effects may become more relevant as the complexity of the decision-making situation increases. Our theoretical argumentation and empirical analyses suggest that the effect of individuals' motivational factors is not the same in all conditions and may vary according to the organizational context and the complexity of the decision-making situation. We provide a more comprehensive demonstration of how regulatory theory can be used (Hoyle, 2010) to study the strategic actions of managers.

Third, a growing body of research has emphasized the need for complexity to be considered a key factor in making sense of how managers behave and respond in different decision-making situations (Sargut & McGrath, 2011; Larsen et al., 2013). Complexity imposes a high degree of uncertainty and unpredictability

regarding the outcomes of managerial decision-making (Balasubramanian & Lieberman, 2010; Sargut & McGrath, 2011), and this makes it an important factor in studying managers' choices in different decision-making situations – for example, in terms of the accuracy (Larsen et al., 2013) and timing (Raaijmakers et al., 2015). We posit that although the regulatory focus of managers and its fit with organizational triggers affect the managers' exploration orientation, the combined effect of these two factors tends to be contingent on the complexity of the decision-making context. We provide explanations that enable us to develop a better understanding of the psychological foundations of a manager's exploration in response to complexity. Drawing on the idea that complexity may activate self-regulatory systems (Bandura & Jourden, 1991), our study explains how dealing with complexity has important implications not only for managerial preferences but also for managers' receptiveness to motivational cues from the organizational context. We test our theoretical framework using two experiments conducted with product managers in a large multinational corporation and master students in a business school.

2.2 Theoretical Overview

2.2.1 A Psychological Perspective on Managers' Exploration

To explain a manager's exploration orientation, we use RFT (Higgins, 1997; 1998) which proposes that individuals have two distinct motivational systems. A promotion focus is concerned with aspirations for growth,

advancement, achievement, and ideals, and emphasizes gains (Crowe & Higgins, 1997). It is sensitive to the presence and absence of positive outcomes and focuses people on a promotion goal and approach tendencies (Higgins, 1997; 1998). Promotion focus leads individuals to a state of eagerness in which they desire to achieve "hits" and avoid "errors of omission" (i.e., to avoid closing off possibilities) (Higgins, 1998, p.27). They consider different criteria (Higgins, 1998), thereby broadening their search and considering different alternatives when dealing with problems that require such variance-seeking. A prevention focus is concerned with prudence, safety, and obligations, and emphasizes losses (Crowe & Higgins, 1997). It is sensitive to the presence and absence of negative outcomes and focuses attention on a prevention goal and avoidance tendencies (Higgins, 1997; 1998). It drives individuals to a state of vigilance in which they insure against "errors of commission" (i.e., they seek to avoid mistakes) (Higgins, 1998, p.27). It involves a strategic preference for avoiding mismatches or ensuring correct rejections. Therefore, having higher prevention focus, individuals tend to ensure safety and non-losses, stick to one approach, narrow search, and avoid failure. Table 2-1 demonstrates summary of the differences between prevention and promotion focus.

Prevention and promotion foci are general orientations "which serve as a general reference point by which people view their world" (Johnson et al., 2015, p.1504). Research has shown that individuals differ in their predisposition to

regulatory focus (e.g., Higgins, et al., 1997) and there is some consistency in this regard over time (e.g., Gomez et al., 2013; Higgins et al., 2001).

Table 2-1 Attributes of regulatory focus, promotion and prevention

	Promotion	Prevention	Source
Dominant self-guide	Ideal self-guide, representation of the attributes that someone would like ideally to possess	Ought self-guide, representation of attributes that some one believes they should or ought to possess	Higgins & Tykocinski(1992)
Regulation with respect to survival need	Nurturance-related regulation	Security-related regulation	Higgins (1998)
Goals	Wishes, hopes, aspirations for them	Duties, obligations, necessities	
State	Eagerness to attain advancement and gains	Vigilance to ensure safety and non-losses	Higgins et.al. (1994)
Outcome	Sensitive to events involving absence and presence of positive outcome	Sensitive to events involving absence and presence of negative outcome	Higgins & Tykocinski(1992)
Strategic inclination	To be prudent, precautionary, avoid mismatches to the desired end state Insure hits and against errors of omission	To make progress by approaching matches to the desired end state Insure correct rejections and against errors of commission	Crowe & Higgins(1997), Higgins (1998), Liberman, Molden, Idsonand Higgins (2001)
Consideration of alternatives	Simultaneous consideration of multiple alternatives	Consideration of fewer alternatives	Liberman, Molden, Idsonand Higgins (2001)
Preference for change	Induced preference for change	Seeking stability	Liberman, Idson, Camachoand Higgins (1999)
Strategic preference	Approaching matches	Avoiding mismatches	Crowe & Higgins(1997)
Bias	Risky bias	Conservative bias	Crowe & Higgins(1997), Higgins (1998)

We follow many scholars in considering this aspect of regulatory focus to be a trait. However, it is important to note that individuals' levels of promotion and prevention foci are shaped by both internal and external influences. Individual regulatory focus is therefore also affected by contextual cues (Förster et al., 1998) and it is possible to induce situational promotion or prevention focus by use of certain triggers (see Higgins, 1998; Shah & Higgins, 2001). Hence regulatory focus differs from other personality traits such as Big Five traits. Promotion and prevention foci are also independent rather than representing opposite ends of a continuum (Higgins, 1997; 1998; Johnson et al., 2010). People can therefore have high levels of both promotion and prevention foci, just one focus, or neither focus, and it is thus better to examine the two foci separately.

Managers' choice of strategic action in general and their orientation towards exploratory behavior in particular are influenced by persistent traits (Lavie et al., 2010). An exploratory orientation of managers refers to a preference for engaging in activities that require deviation from the current stage, consideration of different alternatives, and achievement of novelty. Such activities increase the probability of failure since their outcomes are uncertain and distant. When uncovering the foundations of exploration orientation, scholars have tended to investigate how managers' access to knowledge flow (Mom et al., 2007) and their relational capital (Mom et al., 2015) may affect their engagement in exploratory activities. There has been less emphasis on motivational determinants

and how contextual factors may shape the relationship between motivational aspects and a manager's exploration orientation. Yet, as a psychological factor, motivation is of high importance inasmuch as it can be defined as "the reasons underlying behavior" (Guay et al., 2010, p.712). Table 2-2 demonstrates the aspects of regulatory focus which are relevant to discussion of exploration.

Table 2-2 Regulatory focus aspects relevant to exploration

Exploration aspect	Relation with regulatory focus	Source
Search	Promotion focus facilitates memory search by mitigating against retrieval blocking	Friedman and Förster, 2001
Considering/generating different alternatives	Promotion-focused individual wants to ensure "hits" and insure against errors of omission.	Higgins, 1998 ; Crowe & Higgins, 1997
	Individuals with a promotion focus generate more hypotheses (i.e., alternatives) than individuals with a prevention focus.	Liberman, Molden, Idsonand Higgins , 2001
	Individuals with a promotion focus are inclined to simultaneously consider multiple alternative hypotheses whereas individuals with a prevention focus try to choose a smaller subset of alternatives.	
Novelty of alternatives	Promotion focus enhances the ability to generate creative alternatives.	Friedman and Förster, 2001
Deviation from current stage	When the old alternative represents a safe acceptable option, as in situations involving task substitution, promotion focus induces a preference for change whereas prevention focus is associated with seeking stability.	Liberman, Idson, Camachoand Higgins ,1999

Embracing failure/high probability of failure	Prevention focus is concerned with the presence and absence of negative outcomes. Individuals are more inclined to ensure against errors of commission or "making a mistake".	Crowe & Higgins, 1997
	Sensitivity to events involving the absence and presence of negative outcomes is greater when 'ought' concern predominates (prevention focus).	Higgins, 1998
	Prevention focus makes the minimization of negative outcomes a necessity.	Das and Kumar, 2010

2.2.2 **Regulatory Focus, Organizational Context, and Complexity**

The contextual perspective (Rousseau, 1978; Salancik & Pfeffer, 1978; Ansari & Kappor, 1987) suggests that the organizational context, in addition to individual traits, may shape the ways in which managers deal with decision-making problems. For instance, leadership styles (Ansari & Kappor, 1987) or internal organizational systems (Sharma, 2000) may affect managers' interpretation of a decision-making situation and their response. As such, the organizational context is instrumental in the construction of meaning in that it sets expectations regarding how individuals should behave and the consequences of that behavior (Salancik & Pfeffer, 1978). Hence, prior research (e.g., Higgins, 1997; Zhang et al., 2010) suggests that contextual cues that emphasize prevention or promotion can influence individual decision-making and behavior.

Embedded within the organizational context, goals, values, compensation and reward systems – as well as interpersonal interactions and communications –

may affect the promotion and prevention foci of individuals when dealing with decision-making situations (Brockner & Higgins, 2001; Johnson, et al., 2010). When the emphasis of the organizational context characteristics – goals, values, communication approach, or reward systems – are on recognizing people for a job well done (and withholding recognition when the job is not well done) and draws attention to the positive outcome and opportunities for advancement, it activates their promotion system (Brockner & Higgins, 2001). This could be called a "promotion-focused organizational context". Conversely, when the organizational context focuses on sanctioning people for a job that has not been done well (and not sanctioning them when the job is well done), and draws attention to negative outcomes and obligations, individuals' prevention focus will be activated. This can be termed a "prevention-focused organizational context".

The emergency rooms of hospitals are likely to be characterized by a strong prevention-focused organizational context. Here, goals and values focus on survival, and this depends on preventing circumstances in which the patients are at risk. Therefore, sensitivity to negative outcomes is a common consideration, and minimizing the possibility of its occurrence becomes the main goal in most of the decision-making situations for individuals. By contrast, an entrepreneurial start-up is likely to have a strong promotion-focused organizational context. Such companies often reflect the vision, dreams, and ideals of their founders in different shapes of norms and goals (for example, goals for expansion), so that the ideals of the founder and focus on maximal goals and growth, and sensitivity to the

occurrence of positive outcomes are significant parts of the organizational context which can affect individuals' decisions through promotion focus. This contextual perspective suggests that a manager's decision can be influenced by contextual cues that indicate what is appropriate and is expected by the organization.

The complexity of the decision-making task is another contextual factor that could significantly affect the relationships between individuals' regulatory orientation, regulatory-focused organizational context, and their preference for exploratory activities. Multiplicity (large number of factors), interdependence, and diversity (heterogeneity among factors) of influencing factors are important features of complexity that impose high degrees of uncertainty and unpredictability concerning the outcomes of managerial decision-making (Balasubramanian & Lieberman, 2010; Sargut & McGrath, 2011) and the appropriateness of the means for achieving desired outcomes (Campbell, 1988; March & Simon, 1958). Decision-making that involves a large number of factors or merely heterogeneity among factors is not simple, since making a decision in favor of a group of elements might cause disruption in the functioning of other elements (Ethiraj et al., 2012). However, this situation need not be highly complex, because the decision-makers might have a lot of information about how the involved factors will perform (Balasubramanian & Lieberman, 2010), and hence be able to use that to predict the potential outcome (Sargut & McGrath, 2011). The interaction between these factors can greatly increase the complexity (Simon, 1962), because besides understanding the individual factors, additional

cognitive effort is required to predict how they may be related (Espinosa et al., 2007). In fact, the same starting conditions can produce different outcomes, depending on how different factors play a role, and therefore interact with and affect each other and finally shape the outcome.

Complexity precludes the identification of optimal decisions and raises the importance of behavioral processes in decision-making (Rivkin, 2000). It has implications in terms of information-processing (Byström & Järvelin, 1995). As such, it imposes heavy decisional demands that are likely not only to increase the range of decision strategy (Payne, 1976), but also to activate individuals' motivational processes and, in particular, to stimulate effective use of self-regulatory systems for competent functioning (Bandura & Jourden, 1991). We investigate the contingency role of decision-making task complexity in the relationship between individual regulatory focus, organizational context, and exploration orientation.

2.3 Hypotheses

2.3.1 Managers' Regulatory Focus Trait and the Pursuit of Exploration

We argue that a manager's regulatory focus trait will be related to his/her exploratory orientation for two main reasons. First, regulatory focus is known to be influential in determining the search behavior of individuals. A strong promotion focus increases the number of options that an individual will consider when a decision has to be made (Pham and Chang, 2010). In other words, a

stronger promotion focus generates a desire to increase the chances of success by trying as many alternatives as possible (to generate more hits) and reduce the chances of overlooking a potential solution (Higgins, 1998; Liberman et al., 2001). Also, while individuals with higher levels of promotion focus tend to process information more globally, those with higher levels of prevention focus are more inclined to process information more locally (Förster & Higgins, 2005; Semin et al., 2005). This is because a more global search is instrumental in fulfilling the eagerness of individuals with higher levels of promotion focus to identify opportunities for success and minimize errors of omission. Conversely, a more local search helps individuals with a higher level of prevention focus to examine a limited number of best options in detail and minimize the possibility of loss (Pham & Chang, 2010). Considering a larger set of alternatives (Smith & Tushman, 2004) and using a more global search (McGrath, 2010), we expect managers with a higher level of promotion focus (prevention focus) to engage more (less) in exploratory behavior.

Second, managers with a strong promotion focus are more sensitive to future success and gains, while those with a strong prevention focus are more focused on possible future failure and loss (Higgins, 1998). Ensuring the hits by performing acts of commission in response to perceived chance of gain promotes a bias towards positive outcomes based on promotion focus, whereas avoiding errors of commission and performing acts of omission in response to perceived chances of losses gives rise to an avoidance bias for the decisions based on prevention

focus (Crowe & Higgins, 1997). Since managers with a stronger promotion focus are inclined to give more weight to gains than to losses and to take more risks, they tend to focus on more uncertain potential long-term benefits (Lavie et al., 2010) and show a more exploratory orientation. Conversely, managers with a stronger prevention focus tend to give more weight to possible losses that may come with exploratory actions and therefore focus on benefits that are more proximate, certain, and immediate (Lewin et al., 1999; March, 1991). This sensitivity to possible failure and loss can create a bias toward deploying existing competencies persistently at the expense of exploring new ones (Lavie et al., 2010). We therefore argue that:

> *Hypothesis 1: Regulatory focus trait is associated with the exploration orientation of managers such that a) promotion focus is positively and b) prevention focus is negatively associated with the exploratory orientation of managers.*

2.3.2 The Moderating Role of Organizational Context: Regulatory Fit

Prior research suggests that the effects of prevention or promotion focus traits vary in different conditions. Particularly, Higgins (2000) suggests that such effects are accentuated when the characteristics of the situation are congruent with individuals' regulatory focus trait, a phenomenon called "regulatory fit". In fact, people experience regulatory fit when the manner in which they engage in an activity sustains their current orientation (Higgins, 2000; 2003). For example, when the task incentive is aligned with the regulatory focus of the individual, both

promotion focus and prevention focus enhance performance and persuasion (Lee & Aaker, 2004; Shah et al., 1998). Another example is the match between the strategic framing of a message and the regulatory focus of individuals that affected evaluations of an object (Higgins et al., 2003). Although research on the effect of regulatory fit in organizations is scarce (Lanaj et al., 2012), Gamache and his colleagues (2015) have provided empirical evidence that incentives can reduce the risk-aversion tendencies of CEOs with a high prevention focus, and can affect the number and value of acquisitions made by a firm.

When individuals find themselves in a condition which fits with their regulatory focus, they "feel right" about what they intend to do (Camacho et al., 2003; Higgins et al., 2003; Lee & Aaker, 2004). Here, the goal pursuit feels right to them, which is "an experience of correctness whose source is the individual's use of a strategy that his or her regulatory orientation prefers" (Camacho et al., 2003 p.499). When a manager makes decisions in an organizational context that provides cues which align with his or her regulatory focus, the motivation is being strengthened because the person "feels right" about the strategy of goal pursuit (Johnson et al., 2015). In this respect, an organizational context that emphasizes the opportunities for advancement and growth and sensitizes managers to the possible gains would transfer that "experience of correctness" to a manager with a strong promotion focus trait. The stronger the promotion focus of managers, when they operate within a context that offers possibilities for advancement and growth and emphasizes possible gains, the more clearly they envision the potential to

achieve superior outcomes and create opportunities for growth. This does not simply satisfy the need of the individual with a strong promotion focus but can act as a "preferred manner of goal pursuit" (Cesario et al., 2008, p.455), because it sustains the regulatory focus of the individual. Therefore, the manager will be more motivated to engage in risky endeavors and to seek outstanding and far-reaching outcomes, and will, in general, have a more positive orientation toward exploration.

Similarly, as the level of prevention focus trait increases, a manager will have a greater sense of being "right" to avoid activities that carry the risk of failure and have uncertain benefits if operating within an organizational context which lays stress on obligations and possible losses, rather than in one which emphasizes possible gains and opportunities for advancement and growth. As a result of this type of match between organizational context and the regulatory focus trait of managers, the effects of the regulatory focus trait on exploration orientation will be accentuated. Therefore, we expect there to be an intensification of the behavior that we hypothesized previously, based on the corresponding regulatory focus trait, and we argue that:

Hypothesis 2: Regulatory fit is associated with exploration orientation in such a way that (a) a promotion-focused organizational context strengthens the positive relationship between a manager's promotion focus trait and his or her exploratory orientation, and (b) a prevention-focused organizational context strengthens the negative relationship

between a manager's prevention focus trait and his or her exploratory orientation.

2.3.3 The Contingency Role of Decision-making Complexity

Under high levels of complexity, the information-processing abilities of individuals fail to commensurate high demands for information-processing in dealing with many different factors, interdependencies between those factors, and the considerable uncertainty. Such limitations constrain objective decision-making (Abelson and Levi 1985); decision-makers come to rely on more subjective criteria (Filley et al., 1976; Van de Ven, 1986) in favor of strategies that require less information-processing capacity. When the correctness of decision-making outcomes can rarely be judged, individuals increasingly prioritize the perceived legitimacy of their decision as the dominant evaluation criterion (Van De Ven, 1986) and involve themselves in considerable interpretation and construction of meaning (Bates, 1986; Kuhlthau, 1999; Whittemore & Yovits, 1973) in order to assess the appropriate ways of thinking, feeling, behaving (Bandura, 1977; Festinger, 1957) to modify them accordingly. In particular, high levels of complexity activate individuals' self-regulation systems (Kanfer & Ackerman, 1989; Bandura & Jourden, 1991), so that they rely more on information that is relevant to their regulatory concerns before constructing a preference in their decision-making (Wang & Lee, 2006). Conversely, in situations of low complexity, individuals are not subject to the same limitations in terms of information-processing, and can therefore deal with all pieces of information more

systematically, and rather independent of the relevance to their regulatory concerns.

This observation has important implications for the effect of regulatory fit on exploration orientation. When dealing with less complex decision-making tasks, managers tend to rely more on the outcome of very rational processing of information related to the problem as the basis for their choice of exploration versus exploitation approach. In this situation, where they attend systematically to information independent of regulatory relevance, the available motivational cues in the context and their fit with individual regulatory orientation are less likely to suppress systematic attention to all available information relating to the problem at hand; as such, objective processing of that information prevails over subjective thinking driven by motivation systems. However, when faced with a highly complex decision-making task, managers increasingly rely on their guidance from their regulatory system and use this as a way of countering the limits of their information-processing capability. Therefore, it is more likely that they experience the type of regulatory fit which we hypothesized earlier. A manager with a strong promotion focus will pay attention to and prioritize available cues in the context that emphasize gains and achievements and, as we discussed before, are conducive to exploration. Such selective attention to matching motivational cue strengthens the reception of that regulatory trigger from the environment and intensifies the sense of "feeling right" and the experience of correctness that we discussed in the arguments leading to hypotheses 2a and 2b. In other words, where there is a high

level of decision-making complexity, the effect of regulatory fit experienced by the manager increases.

In light of the above, we argue that:

Hypothesis 3: Complexity, organizational context, and the regulatory focus trait of managers interact in their effect on managers' exploratory orientation such that a greater level of complexity will intensify the effect of the fit. In fact, a greater level of complexity will intensify both a) the positive effect of a promotion-focused organizational context on the relationship between the promotion focus trait of managers and their exploratory orientation and b) the negative effect of a prevention-focused organizational context on the relationship between managers' prevention focus trait and their exploratory orientation.

2.4 Method

We use experimental method in two studies to test our hypotheses. While exploration research has not traditionally included experiments, with an exception being Laureiro-Mart and Brusoni's work (2015), recent work has shown how beneficial experiments can be in investigating questions about decision-making (Agarwal et al., 2010; Song et al., 2002). A major benefit of conducting experiments is that they provide higher internal validity for drawing conclusions about the causal direction between related variables (Campbell et al., 1966). Generally, the drawback of experiments is that external validity may be limited, because generalizing from a laboratory environment to real-world settings is more

difficult than generalizing from one real-world setting to another. We believe that conducting two studies has enabled us to achieve an acceptable balance between external and internal validity. In study A we use professional decision-makers and design manipulations to be close to the reality of their work. In study B we use students in order to provide an additional test of our framework with participants who have different characteristics and working contexts from those in our first experiment.

2.5 Study A

2.5.1 Research Setting and Participants

Using information from our pilot tests, we designed an experiment to be carried out with product managers of a large multinational telecom company. The company has more than 110,000 employees, working in more than 180 countries. A key aspect of this company is that it invests substantially in R&D, which has resulted in more than 33,000 patents. The company is more than 150 years old, and given its size, scope of operation, and financial turmoil, both R&D investment and cost efficiency are key concerns for the shareholders and senior managers. This setting is appropriate for our study for a number of reasons. First, although the telecommunications industry is at the forefront of innovation activities because of recent advances in technology and market changes, it is also characterized by old traditions and by large incumbents that need to be efficient. This makes trade-offs between exploration and exploitation particularly significant for managers

working in this industry. Second, we identified a homogenous population of managers within a single organization who had the same level of decision-making authority and similar relevant experience, as homogeneity is an important consideration for ensuring the quality of the experimental design (Webster & Sell, 2014). Our research design allows us to ensure there is a high level of homogeneity without losing the value of using relevant business practitioners working in a real business context. Third, we did not involve participants who were solely responsible for advancement, growth, and innovation, and might therefore be biased by their roles and the context of their work. Instead, we invited product managers who were responsible not only for dealing with short-term demand, efficiencies, and minimal goals but also for long-term product advancement strategies for the evolution of the company's products in a high-tech industry. As influential middle managers they are therefore ideal subjects to use for studying the trade-offs related to the organization's exploration activities. Finally, we focused on this business context because we have extensive understanding of the sector.

The materials for the experiment were designed in such a way that they contain a recent phenomenon in the industry, cloud computing. We identified cloud computing as a proper setting in which simulating different levels of complexity in our design would seem realistic. In fact, cloud computing is an inherently complex phenomenon and the levels of complexity can differ, making it ideal for our study. We were able to gain agreement from 142 product managers

(83% male, Mage = 44, SDage = 10.9) to participate voluntarily in this experiment. Participants were randomly assigned to the cells of a 2 × 2 between-subject design. Out of the 142 who initially agreed, 122 product managers (85% of the volunteers) finally completed the procedure, and their data were used in the analysis (85% male, M_{age} = 45, SD_{age} = 10.6). In our attempt to balance the external and internal validity, we tried to limit the possible specific effect of this organization first by writing a simulated scenario, and second by asking managers to react to a decision-making situation purely based on the information provided in the experiment and regardless of their actual work environment in this organization. Moreover, we used videos to increase the chance of participants becoming immersed in the context described in the vignette and to increase the external validity of our study (Aguinis & Bradley, 2014).

2.5.2 **Procedure and Manipulations**

The participants were briefly informed about the experiment in an invitation email. The data collection was planned in two stages. In the first stage, two weeks before the experiment, participants were asked to complete a personality test, which included items relating to regulatory focus trait. In the second stage, each participant received a brief manual and an electronic link to the experiment. Each participant was given a scenario and asked to watch a video, on a random basis. Then, they were asked to review the case and think a few minutes before making any decision. Subsequently, dependent variable and manipulation

checks were administered, and participants were thanked and told that they would be informed of the results.

We operated two manipulations: one relating to decision-making task complexity and the other to organizational context (see Appendices 2-A and 2-B). For the decision-making task complexity manipulation, each participant received a written scenario of either high or low complexity. Before constructing the scenarios, we compiled a list of topics by drawing on several sources: articles in leading journals in the field, cases on technology change and product development, and interviews with two business researchers and one technology expert in the company's R&D center. The two scenarios were drafted from these resources, and in close collaboration with a product manager, in order to include elements of complexity that were based on several factors in a product manager's decision-making process in the workplace.

The final vignette covered technical considerations, customer requests, interactions with suppliers and other external parties, and other business elements, such as a pricing model. In the high-complexity case, we referred to "a general agreement", whereas in the low-complexity case we referred "some specific features". This distinction provides an important clue in terms of the means–ends uncertainty (Campbell, 1988; March & Simon, 1958) that is an important driver of complexity, especially in the context of product development (Hass, 2009). Moreover, in the high-complexity case we highlighted a systemic effect on many interdependent aspects of the product and its roadmap, and also on the business

model and relationships with other departments. Such clues point toward increased complexity in terms of a need to deal with many interdependent and diverse factors (Simon, 1987; Balasubramanian & Lieberman, 2010). To select the involved factors for manipulating the number, diversity, and interdependency of factors, we carefully attended to both complexity and product development literature. For example, in the highly complex case, we emphasized the need for "involvement of new suppliers", as this brings with it uncertainty over reliability and predictability of supply (Bozart, et al., 2009) and creates a considerable complexity in the coordination and planning of product development activities (Almirall & Casadesus-Masanell, 2010). In the high-complexity case, a large number of diverse and interdependent elements therefore played a role and the emphasis was on unpredictability, uncertainty, and potential unknown elements. By contrast, the low-complexity case included a few known, certain, and influential elements. There was a strong emphasis on predictability and certainty, and the case did not include many interdependencies.

For the manipulation of a regulatory focus organizational context, we created two different situations for the decision-making of participants by framing of the context. Each participant was exposed to either a promotion-focused or prevention-focused organizational context by being asked to watch one of two videos after reading the scenario. In these videos a manager shared his evaluation of the situation with the participant, either by depicting a promotion-focused context or prevention-focused context. He emphasized either: (a) positive

outcomes, focusing on ideals, potential for advancement, future gains, and opportunities; or (b) negative outcomes, obligations and duties, potential for stability, future losses, and threats. The words used in the two videos were selected carefully to create two contrasting videos with similarly structured sentences, and were checked by two academic experts. Non-verbal language was kept consistent in both videos (e.g., similar body language, no demonstration of emotions).

Finally, the materials were reviewed and discussed by an academic expert in experiment design, a product manager, an expert in vignette studies, and then revised accordingly by two PhD students. In the analysis section, the manipulations were coded as follows. The complexity of the decision-making task manipulation is expressed by the *Complexity* (*CPX*) variable, which is equal to 1 if the managers received a high-complexity scenario, and 0 otherwise. The regulatory-focused organizational context manipulation is expressed by the *Regulatory-focused situation* variable *(RFS)*, which is equal to 1 if the managers watched the promotion-focused video, and 0 otherwise.

2.5.3 **Measures**

Dependent variable

We adapted the original measure for exploration orientation (Mom et al., 2007) to make it in line with the specific context of this study (see Appendix 2-C). The items were modified to best match the scenario and specific decision-making context that managers encountered in this experiment. For example, the items included: “I choose strong renewal and change of the existing product architecture

and roadmap" vs "I choose incremental and stepwise adaptation of existing product architecture and roadmap", and "I search for possibilities to introduce radically new products/services" vs "I search for possibilities to improve existing products/services". The reliability score is at 0.75. In order to better resemble the trade-off nature of the exploration and exploitation decisions made by managers at the individual level, we used a bipolar scale, which is suitable for this purpose (Emmert & Barker, 1989; Gupta et al., 2006).

Independent variables

To measure the regulatory focus trait of each participant, we adapted the work-related regulatory focus measure devised by Neubert, Kacmar, Carlson, and Chonko (2008). We included eight items from both regulatory foci. We selected the eight items by choosing the four highest loading items from each of the two foci. We covered all aspects (achievement, ideals, gains) of promotion focus and all aspects (security, ought, losses) of prevention focus that were discussed by Neubert and colleagues(2008). We asked respondents to what extent the items describe them (1 = not at all true of me; 7 = very true of me). For example, the items included: "I concentrate on completing my work tasks correctly to increase my job security"; "I tend to take risks at work to achieve success"; "At work I focus my attention on completing my assigned responsibilities"; and "I take chances at work to maximize my goals for advancement". The reliability measure is 0.63 for prevention focus and 0.79 for promotion focus.

Manipulation checks

As a complexity manipulation check, at the end of the study (after the measurement of the dependent variable), participants were asked to rate the complexity of the case they had received. In addition, they were asked about the extent to which the interdependencies of the elements involved in the case created uncertainty. A 2 (high complexity vs low complexity) by 2 (promotion vs prevention) ANOVA on manipulation check measure of complexity yielded statistically significant main effects only for complexity ($F=127.6$, $p<.001$). The same analysis of the additional measure of interdependency showed similar results ($F=179.7$, $p<0.001$).

As a regulatory-focused organizational context manipulation check, participants were asked to write about the main considerations and goals in the specific situation they were encountering and the potential consequences of that situation for them. Next, an independent coder coded the texts written by the participants, and counted the number of promotion words and prevention words used, according to the relevant word list provided by Gamache et al. (2015). A 2 (high-complexity vs low-complexity) by 2 (promotion vs prevention) ANOVA on the number of promotion words used in participants' written texts showed statistically significant main effects only for this manipulation ($F=50.9$, $p<0.001$). The same analysis of the prevention words used by participants showed statistically significant main effects only for this manipulation ($F=39.27$, $p<0.001$).

We included controls for participants' years of relevant experience, gender, age, and need for cognition in our analyses, and the results did not change.

We therefore present our results using only main variables in our models. Need for cognition was important as a control variable because individuals' need for cognition affects their enjoyment of engaging in complex situations , their reaction to complexity (Cacioppo et al., 1996; Wu et al., 2014), and the ability to recall and process information relevant to the situation they are in (Cacioppo et al., 1996). In our case, participants were required to recall and process several different pieces of the information, and our theory was implicitly related to the information-processing limitations of particular situations. We used a version of need for cognition scale (Cacioppo et al., 1984), which included six items, following Wu et al. (2014).

2.5.4 **Results**

Table 2-3 shows the descriptive statistics and correlations and Table 2-4 presents the results of the regression analyses. Model 1 includes the main effects, the traits, and manipulations, to test hypotheses 1a and 1b. We find that complexity has a direct and positive effect on exploratory orientation, and this suggests that, when faced with complex decision-making tasks, managers tend to embrace exploratory activities. Turning to our main independent variables, we find that the regulatory focus trait is associated with the exploratory orientation of managers. Promotion focus is found to be positively associated with the exploratory orientation of managers ($B=0.22$, $SE=0.08$, $P<0.05$), while prevention focus is negatively associated with it ($B= -0.44$, $SE=0.10$, $P<0.001$). These findings are consistent with hypotheses 1a and 1b.

Table 2-3 Descriptive statistics and correlations- Study A

	Mean	SD	1	2	3	4	5	6	7
1- Exploration orientation	3.4	1.4							
2-Relevant experience	9.5	5.7	-0.032						
3- Age	45	10.6	-0.006	0.381*					
4- Need for cognition	5.7	0.74	0.152	0.176	-0.016				
5- Regulatory focus trait – Prevention	5.2	.99	-0.227*	0.031	-0.036	0.018			
6- Regulatory focus trait – Promotion	4.3	1.32	0.090	-0.157	-0.176	0.195*	0.250*		
7- Complexity	0.52	0.5	0.510*	0.054	0.111	-0.091	0.063	-0.082	
8- Regulatory focus Organizational situation	0.47	0.5	-0.032	-0.186	-0.040	-0.013	-0.078	-0.082	-0.014

N= 122, *Correlation is significant at the 0.05 level.

To test hypothesis 2 relating to regulatory fit, we followed Higgins et al. (2003, study B) and included the interaction (as the effect of regulatory fit) of the regulatory focus situation and regulatory focus trait in Models 2 to 4. We find that the interaction between the promotion-focused situation and the promotion focus trait of the individuals is not statistically significant. Thus, our hypothesis 2a is rejected. However, the interaction between the prevention-focused situation and the prevention focus trait of the individual is found to be statistically significant (B=0.46, SE=0.20, P<0.05). The simple slope test confirms the difference between slopes (t =-4.690, p=0.000). To ease the interpretation, we plot the interaction effect. Figure 2-1 shows that a prevention-focused organizational context (blue

line) can intensify the negative effect of the prevention focus trait on managerial inclination for exploration activities. Indeed, the stronger the prevention focus of managers, the lower their exploration orientation in prevention-focused situations, rather than in promotion-focused situations. This result supports hypothesis 2b. Model 4 includes both interaction terms.

Model 5 shows the results of the three-way interaction between complexity, promotion-focused context, and promotion focus trait. The coefficient is statistically significant (B=0.66, SE=0.31, P<0.05), which is consistent with hypothesis 3a. Further, we tested the conditional effect of two-way interactions at values of complexity. The result confirmed that the two-way interaction is indeed significant (B=0.54, p<0.05) under high complexity but non-significant (B=-0.11, p>0.05) under low complexity. Moreover, we tested the difference between simple slopes. The difference is significant (t =2.369, p<0.05) between the slope of promotion context-high complexity condition and the slope of prevention context-high complexity condition. However, a similar test on the difference between the slope of promotion context-low complexity condition and the slope of the prevention context-low complexity condition proved to be non-significant (t =-0.46, p>0.05).

Table 2-4 Regression results of Study A

Dependent variable: Exploratory orientation

	M1	M2	M3	M4	M5	M6	M7
Traits/characteristics							
Prevention focus trait (CPre)	-0.446***	-0.441***	-0.597***	-0.583***	-0.443***	-0.609***	-0.626***
	(0.108)	(0.108)	(0.127)	(0.130)	(0.106)	(0.167)	(0.173)
Promotion focus trait (CPro)	0.224**	0.141	0.219**	0.172	0.219	0.229**	0.272+
	(0.0809)	(0.110)	(0.0797)	(0.110)	(0.141)	(0.0802)	(0.146)
Manipulations							
Complexity (CPX)	1.523***	1.528***	1.524***	1.526***	1.324***	1.352***	1.354***
	(0.206)	(0.206)	(0.203)	(0.203)	(0.280)	(0.279)	(0.278)
Regulatory focus organizational situation (RFS)	-0.0893	-0.0793	-0.0483	-0.0455	-0.306	-0.293	-0.273
	(0.205)	(0.205)	(0.203)	(0.204)	(0.292)	(0.296)	(0.295)
Two-way interactions							
CPro × RFS		0.172		0.0989	-0.110		-0.175
		(0.156)		(0.159)	(0.207)		(0.217)
CPre× RFS			0.465*	0.431*		0.153	0.247
			(0.218)	(0.224)		(0.326)	(0.341)
CPro × CPX					-0.200		-0.242
					(0.217)		(0.221)
RFS × CPX					0.517	0.444	0.504
					(0.406)	(0.408)	(0.407)
CPre × CPX						0.0348	0.0842
						(0.255)	(0.260)
Three-way interactions							
CPro ×RFS × CPX					0.660*		0.655*
					(0.312)		(0.320)
CPre× RFS × CPX						0.493	0.294
						(0.445)	(0.457)
Constant	2.648***	2.651***	2.651***	2.652***	2.753***	2.740***	2.732***
	(0.179)	(0.178)	(0.176)	(0.176)	(0.204)	(0.204)	(0.203)
N	122	122	122	122	122	122	122
R-sq	0.371	0.377	0.394	0.396	0.410	0.410	0.436
Adj R-sq	0.349	0.350	0.368	0.364	0.368	0.367	0.379

N= 122, Standard errors in parentheses, + p<0.10, * p<0.05, ** p<0.01, *** p<0.00

For ease of interpretation, we have created two figures (2-2a, 2-2b). Figure 2-2a shows the interaction between the managers' promotion focus and the promotion-focused situation on exploratory orientation in conditions of low complexity, while Figure 2b illustrates the same interaction in conditions of high complexity. The focus in Figure 2-2b is on the high-complexity condition, and it shows the impact of a promotion- or prevention-focused organizational situation on the relationship between the promotion focus trait of the manager and his or her preference for exploration. It suggests that promotion cues in the organizational context can boost the positive effect of their promotion focus trait on their inclination for exploratory activities when managers are having to deal with a high degree of complexity. However, in situations of far less complexity, this kind of mechanism will not play a significant role. Turning to our hypothesis 3b, in model 6, we do not find evidence that complexity influences the interaction between the prevention situation and prevention focus trait, since the three-way interaction is not statistically significant. Thus, our hypothesis 3b is rejected.

Study B was conducted to provide an additional test of our framework and used a different sample of respondents to explore potential deviations. We used a student sample that enabled us to investigate possible differences in results obtained from professional decision-makers operating in one specific working context and from students who were less likely to be affected by that particular work context. We created an alternative manipulation of complexity (see Appendix 2-D) to ensure

that the initial manipulation did not direct participants to one decision and we included extra manipulation checks.

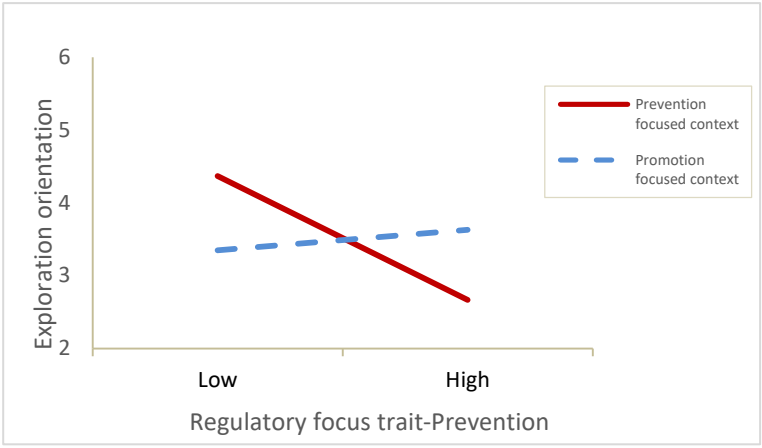

Figure 2-1 Interaction between prevention regulatory focus trait and organizational context – Study A

2.1 Study B

2.1.1 Participants, Procedure, and Materials

One hundred and thirty-nine master students on a strategic management program at a large business school took part voluntarily in the study. The experiment was presented to them as a real business decision-making situation which would allow them to understand more about their own personality and their reaction to managerial decision-making after debriefing. The main experiment and personality test were conducted in one session. Participants were randomly assigned to the cells of a 2×2 between-subject design. All but two of the students (60% male, M_{age} = 23, SD_{age} = 2.02) completed the procedure and were included in

the analysis. The materials were the same as those used in Study A, except for the altered manipulation of complexity.

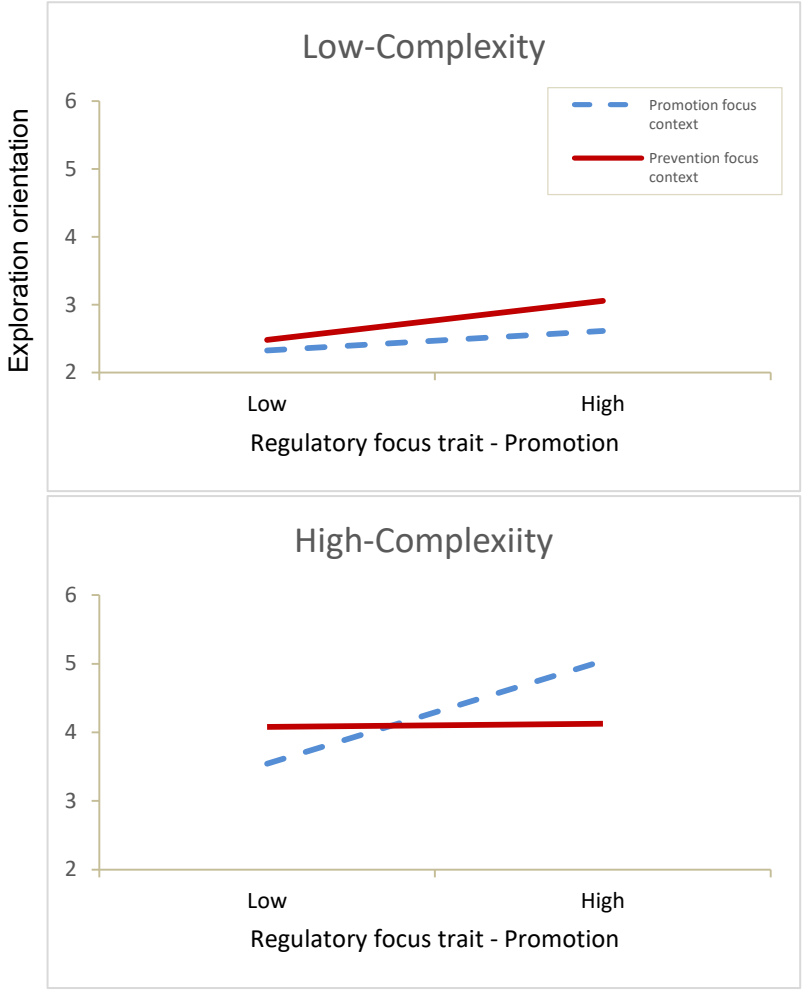

Figure 2-2 Three-way interaction-promotion focus trait, organizational context, and complexity – Study A

2.1.2 **Manipulation Checks**

After the dependent variable had been measured, participants rated the complexity of their case. Similar to Study A, the measure of checking complexity yielded significant main effects only for complexity ($F=14.3$, $p<.001$). In addition, participants were asked three questions about the extent to which uncertainty was imposed by: 1) interdependencies between the elements involved; 2) the variety of elements; and 3) the large number of elements involved in the case. The same analysis of these additional measures showed significant results (respectively: 1) ($F=21.9$, $p<0.001$), 2) ($F=9.5$, $p<0.01$), and 3) ($F=4.9$, $p<0.05$)). The procedure used for the manipulation check of the regulatory-focused organizational context was the same as in Study A. A 2 by 2 ANOVA on the number of promotion words used in participants' written text showed statistically significant main effects only for this manipulation ($F= 45.1$, $p<0.001$). The same analysis on prevention words showed statistically significant main effects only for this manipulation ($F=39.3$, $p<0.001$).

2.1.3 **Results**

The descriptive statistics and regression results of Study B are summarized in Table 2.5 and 2-6. In our tests of hypotheses 1a and 1b, we find that prevention focus is negatively associated with the exploratory orientation of managers ($B= -0.23$, $SE=0.10$, $P<0.001$). We find there to be a positive association between promotion focus and the exploratory orientation of managers, but the coefficient is not significant. We find that the interaction between the promotion-

focused situation and the promotion focus trait of individuals is not statistically significant. Thus, our hypothesis 2a is rejected. Consistent with hypothesis 2b, the interaction between the prevention-focused situation and the prevention focus trait of the individuals is found to be significant (B=0.48, SE=0.21, P<0.05). Model 5 shows the results of the three-way interaction between complexity, promotion-focused situation, and promotion focus trait. The coefficient is statistically significant (B= 1.09, SE=0.47, P<0.05), which is consistent with hypothesis 3a. The graphical representation of the interaction effect was similar to that of study A. We do not find a significant coefficient for the interaction between complexity, prevention-focused situation, and prevention focus trait. We included in our analyses controls for participants' gender, age, and need for cognition, and repeated the slope difference tests. The results were similar to those of Study A.

Therefore, the results of Study B are generally consistent with those of Study A: a higher level of prevention focus in a manager is associated with a lower level of exploration orientation. As with Study A, we find support for hypothesis 2b and not for 2a. In fact, the stronger the prevention focus of an individual, the weaker his or her exploration orientation was in a prevention-focused situation, as opposed to a promotion-focused situation. Again, similar to our findings in Study A, we found support for hypothesis 3a, but not for hypothesis 3b; the results suggested that that when individuals are dealing with situations of high complexity, promotion cues in the organizational context can boost the positive

effect of the promotion focus trait on the individual's inclination for exploratory activities.

One difference between the two studies, however, was that only Study A showed significant positive relationship between promotion focus and exploration. In Study B, while the same coefficient is still positive, it is not statistically significant. This means that we cannot fully reject the null hypothesis for H1a. We believe this discrepancy arises from the difference in work experience of the participants in the two experiments. This is consistent with Wang and Wong (2012), who also suggest the differences in their results stem from the different work experience of their two samples of participants. In fact, the relationship in hypothesis 1 is measured based on a work-related regulatory focus scale designed for individuals with work experience. To make the measurement consistent, we used the same scale for the student sample. However, it is possible that the professionals, who had an average of ten years work experience, may evaluate their own persistent regulatory focus in a working context differently to the students who did not have that experience and a great deal of familiarity with working environments. When we compare the two studies, we also observed that the regulatory focus of the organizational context has a significant effect on the exploration orientation of the students but not on that of the professionals, although we did not hypothesize an effect of this kind. This observation is interesting, as it might reside in the differences in work experience of the samples. It may be that, in our managerial sample, the organizational context that the

managers have experienced over a number of years is reflected to some degree in their own persistent regulatory focus. Therefore, it can be anticipated that their decision-making will be affected more by their persistent trait and its fit to the context, rather than by the context alone (which was the case for the student sample). An alternative explanation for the differences could be that the company we used might have specific regulatory focus characteristics, and if so, the participants in Study A might have been affected by that.

Table 2-5 Descriptive statistics and correlations - Study B

	Mean	SD	1	2	3	4	5	6	7
1- Exploration orientation	4.15	1.23							
2-Age	23.2	2.05	-0.0907						
3-Female	0.4	0.49	-0.0408	-0.0761					
4-Need for cognition	5.2	0.91	0.1153	-0.0832	-0.1083				
5-Regulatory focus trait – Prevention	5.3	0.95	-0.1920*	-0.0221	0.1751*	-0.1336			
6-Regulatory focus trait – Promotion	5.1	0.87	0.1206	0.0310	-0.2615*	0.3741*	-0.1672		
7-Complexity	0.51	0.5	0.2119*	0.0385	0.0387	0.2022*	-0.0423	0.1491	
8-Regulatory focus Organizational situation	0.49	0.5	0.2472*	-0.0281	-0.1042	0.0211	-0.0011	0.0730	0.0222

N= 137, *Correlation is significant at the 0.05 level.

Table 2-6 Regression results of Study B

Dependent variable: Exploratory orientation

	M1	M2	M3	M4	M5	M6	M7
Traits/characteristics							
Prevention focus trait (CPre)	-0.229*	-0.231*	-0.436**	-0.439**	-0.268*	-0.449*	-0.449*
	(0.107)	(0.108)	(0.138)	(0.139)	(0.106)	(0.181)	(0.178)
Promotion focus trait (CPro)	0.0638	0.0770	0.0863	0.0540	0.0954	0.0852	0.0829
	(0.118)	(0.156)	(0.116)	(0.154)	(0.189)	(0.117)	(0.189)
Manipulations							
Complexity (CPX)	0.475*	0.474*	0.502*	0.505*	0.702*	0.699*	0.715*
	(0.202)	(0.203)	(0.199)	(0.200)	(0.276)	(0.277)	(0.275)
Regulatory focus organizational situation (RFS)	0.592**	0.592**	0.589**	0.588**	0.807**	0.787**	0.790**
	(0.200)	(0.201)	(0.197)	(0.198)	(0.281)	(0.283)	(0.280)
Two-way interactions							
CPro × RFS		-0.0301		0.0750	-0.562+		-0.436
		(0.233)		(0.233)	(0.315)		(0.328)
CPre× RFS			0.485*	0.498*		0.575*	0.435
			(0.210)	(0.215)		(0.281)	(0.289)
CPro × CPX					-0.130		-0.146
					(0.323)		(0.324)
RFS × CPX					-0.530	-0.413	-0.498
					(0.397)	(0.397)	(0.396)
CPre × CPX						0.0269	0.0100
						(0.281)	(0.279)
Three-way interactions							
CPro ×RFS × CPX					1.098*		1.035*
					(0.471)		(0.481)
CPre× RFS × CPX						-0.233	-0.0124
						(0.427)	(0.431)
Constant	3.632***	3.633***	3.620***	3.616***	3.528***	3.522***	3.522***
	(0.171)	(0.172)	(0.169)	(0.169)	(0.195)	(0.194)	(0.194)
N	137	137	137	137	137	137	137
R-sq	0.139	0.139	0.173	0.173	0.199	0.182	0.224
Adj R-sq	0.1131	0.106	0.141	0.135	0.15	0.136	0.156

N= 137, Standard errors in parentheses, + p<0.10, * p<0.05, ** p<0.01, *** p<0.00

2.2 Discussion and Conclusion

Prior research suggests that key decision-makers have an important role in reconciling exploration and exploitation (Gibson & Birkinshaw, 2004; Lubatkin et al., 2006; O'Reilly & Tushman, 2011). What is less well understood is how motivational factors influence their orientation toward exploration. To advance research in this area, we looked at expert decision-makers' orientation toward exploration, from a psychological perspective. We used theories of regulatory focus and complexity to provide a framework that would allow in-depth analysis of the motivational drivers of exploration orientation in the organization. In particular, we attempted to portray exploration orientation in organizations as an outcome of decision-makers' persistent traits and reaction to cues in an organizational context, and introduced the degree of complexity as a boundary condition. This study has several important implications.

First, our psychological perspective provides important new insights for researchers who use micro-organizational analyses to study exploration and move beyond recent studies (e.g., Laureiro-Mart & Brusoni, 2015, who took a cognitive perspective) to introduce the motivational aspects. Strategy scholars might thus be able to build on a better understanding of the psychological foundations of exploration/exploitation decisions, which can be used to develop comprehensive models of strategic choice based on the particular characteristics of key decision-makers. Our results show that regulatory focus is a trait that, under certain

conditions, has the potential to shape the strategic preferences of managers, particularly their exploratory orientation.

Second, our framework has important implications for understanding how traits and organizational context interact to form the preference of decision-makers. Our research extends prior research which has for the most part discussed either the trait aspect of regulatory focus in managerial strategic preferences or looked at cues from the organizational context (e.g., Rhee & Fiss, 2014). We have responded to calls for more research on regulatory fit in organizations (Lanaj et al., 2012; Johnson et al., 2010) by exploring the importance of contextual factors as determinants of managers' preferences. Our results demonstrate how promotion and prevention systems have different effects in different organizational contexts, and interestingly we find the match between the context and trait to be significant only in prevention systems – when external cues from the context emphasize prevention by reinforcing the tendency of manager with high level of prevention focus to avoid exploratory activities which are risky. What is also interesting is that the asymmetric effects of regulatory fit for the promotion and prevention systems which we have found are consistent with Gamache and colleagues' (2015) findings about the effects of the fit between CEO regulatory focus and compensation on acquisition decisions. We extend this line of work by revealing the possibility of underspecified models, and introducing the complexity of the decision-making context as a contingent factor in describing such asymmetric

effects in order to provide a more accurate account of regulatory focus theory in studying managerial preferences.

Third, our study is of relevance for the research that investigates the implications of complexity for managers' behavior and choices (Sargut & McGrath, 2011; Larsen et al., 2013; Raaijmakers et al., 2015). Our results show that the level of complexity in decision-making affects the relationships between motivational factors and managers' preferences. In fact, when managers are dealing with a high level of complexity, a conducive effect of promotion-focused organizational context triggers exploratory activities in particular for promotion focus of managers. We did not, however, find complexity to play any significant role in the effect of the prevention aspect of the motivational system. This interesting finding can also be explained by recent studies in neuroscience. For instance, there is evidence that promotion regulatory focus is associated with activities in the left hemisphere of the brain, whereas prevention regulatory focus is associated with activities in the right hemisphere (Amodio et al., 2004). Right-hemisphere structures are known to have an important role in emotional processing (Tranel et al., 2002) while left-hemisphere structures are involved in third-order higher cognitive functioning (Van Den Heuvel et al., 2003); this includes planning, i.e., the ability to achieve a goal by means of a series of steps (Robbins, 1998). Moreover, prior research suggests that increased task complexity is correlated with the involvement of left-hemisphere activities (Van Den Heuvel et al., 2003). In summary, both promotion focus and complexity involve the left

hemisphere and, this may lead to an amplification of their individual effects. In contrast, prevention focus and task complexity involve two distinct parts of the brain, and this may explain the absence of any meaningful interaction between the effects.

Finally, by using experimental vignette methodology, we take research on the trade-off between exploration and exploitation in a new methodological direction. We devised two experiments based on a business problem to which the participants could relate. Involving business managers helped us to increase the internal validity of the results and to avoid artificial responses, as recommended by Aguinis and Bradley (2014). Using students of strategic management in the second study, we could increase the generalizability of the findings by eliminating the potential effects of the particular organizational context of our first study. While micro-level studies in this line of research are still scarce, we have tried to go one step further and provide a better understanding not only of what influences professional decision-makers when making these trade-offs, but also of how they behave the way they do in certain situations. We hope that researchers working on exploration/exploitation trade-offs will embrace this methodology in the future.

3 Study 2- Stretch goals and idea generation: one size fits all?[2]

3.1 Abstract

Despite the desirability of practicing stretch goals for boosting performance and encouraging creativity and assumption-breaking thinking, scholars have started discussing negative consequences of stretch goals. Recent studies either find no direct effect of stretch goals on performance or suggest that stretch goals may foster unethical behavior, intensify relationship conflicts and generate higher performance variance. This study extends recent insights about the paradoxical nature of stretch goals with a multilevel perspective. We examine the implications of setting stretch goals for behavior and performance, and the conditions under which such goals can stimulate idea generation among service employees of a Fortune 500 firm, using multiple sources of data. Our findings underline both the intended and unintended consequences of stretch goals, highlighting the role of prior performance, experience and hierarchical rank in shaping the ability of the individuals for discerning the intended from unintended outcomes in order to extract value from stretch goals.

[2] This chapter is under revision in Organization Science.

3.2 Introduction

Research on goal setting has consistently suggested that goals may shape behaviors and performance of employees because they serve as a regulatory mechanism for action (Locke & Latham, 2002). Beyond just setting a target, however, scholars have argued that using more challenging goals result in additional performance benefits because such targets mobilize enhanced effort and encourage persistence in attaining them (Bandura and Locke 2003, Locke and Latham 2002). In this respect, setting more difficult and novel goals have been suggested to be a particularly important practice when employees need to challenge core assumptions and deploy new skills (Hamel and Prahalad 1993, Sitkin et al. 2011). Such stretch goals, defined as goals that are seemingly impossible to achieve in light of current capabilities (Sitkin et al. 2011), may lead to superior, breakthrough performance by disrupting complacency, promoting new ways of thinking, and instilling persistence (Kerr and Landauer 2004, Shinkle 2012, Thompson et al. 1997).

Importantly, however, scholars have argued that setting targets that are extremely difficult and novel can create downside risks as well (Pina e Cunha et al. 2017, Sitkin et al. 2011). For instance, stretch goals may foster unethical behavior, intensify relationship conflicts, and reduce intrinsic motivation (Ordonez et al. 2009, Zhang and Jia 2013). These disparate findings clearly signal the need for a deeper understanding about whether and under what conditions stretch goals may lead to intended or unintended behaviors consequences (Gary et al. 2017, Sitkin et

al. 2017). Our study builds a multilevel framework about how stretch goals affect the ability of customer-facing employees (service employees in our case) to generate innovative and useful ideas for new business opportunities – a relevant context for managers to deploy challenging goals in order to truly push employees to think differently about the business and their customers (Rapp et al. 2017). Our multilevel theory and unique data allow us to advance research about whether and why stretch goals affect intended and unintended consequences in at least three important ways.

First, we bring together disparate logics and improve our understanding about the paradoxical nature of stretch goals in determining behavioral outcomes (Pina e Cunha 2017, Sitkin et al. 2011, 2017). Our study not only examines whether stretch goals indeed foster idea generation among service employees, but also suggests that when expressing such desired behaviors, the difficulty and novelty of stretch goals make service employees to become less sensitive about the usefulness of those ideas for expanding product and service offerings. As such, despite the fact that stretch goals may encourage service employees to engage in exploratory learning when generating potentially useful ideas for product and service innovation as desired, we argue that such induced behaviors by setting stretch goals lead to both fruitful and futile ideas. While fruitful ideas are deemed valuable by the organization and accepted for implementation and subsequent sales to customers, futile idea are ultimately rejected because of a lack of

(technical) feasibility, misalignment with standing strategies or issues such as market attractiveness. This allows us to extend recent insights about the paradoxical nature of stretch goals and show how they may lead to both intended and unintended consequences when encouraging idea generation among service employees.

Second, recent research has shown that stretch goals generate higher performance variance among individuals (Gary et al. 2017), yet we know very little about the individual attributes shaping such differences. Although scholars have suggested that stretch goals may be more effective when accommodated by structural arrangements, slack resources, prior successes and justice climates (Sitkin et al 2011, 2017, Thompson et al. 1997, Zhang and Jia 2013), they have ignored individual differences in explaining observed variance among individuals (Shinkle 2012). This is surprising because goal-setting theory suggests that individual perceptions about future states and goal difficulty affect individual responses to targets set (Locke and Latham 2002). We build a multilevel contingency model and examine how individual attributes of service employees correlated with their ability to discern good ideas from bad (i.e. their prior success, organizational tenure and hierarchical position) affect the relationship between stretch goals and the generation of valuable ideas. By so doing, we move beyond earlier notions that stretch goals may be universally effective among employees working within the

same context, and show how their effectiveness is dependent on individual characteristics that suggest an understanding of the existing business.

Third, because of the empirical context that we study (new business idea generation), we contribute to research on the microfoundations of organizational innovation (Grigoriou and Rothaermel 2014, Scott and Bruce 1994). We identify the ability of service employees to discern between fruitful and futile opportunities as an important driver of the effectiveness of innovation processes within organizations. Although widely neglected in the literature on idea generation and organizational innovation (Perry-Smith and Mannucci 2017), dedicating organizational resources towards futile opportunities is importantly connected with reduced levels of innovation and effectiveness (Eggers 2012) because failures drain both resources and motivation to continue pursuing innovation. Rather than just focusing on increasing variation by setting more difficult and novel goals, which may cause problems in selection processes, we draw attention to the importance of reducing undesirable outcomes to begin with and discuss how firms may ensure that their increased focus on innovation through setting stretch goals will not result in wasting scarce resources.

3.3 Theoretical overview

A goal represents a desired end state that a person is committed to approaching or avoiding. Goals can differ in various characteristics, which can influence subsequent motivation and performance (Locke and Latham 2002).

Goal-setting theory examines how setting a goal influences subsequent performance when pursuing that goal (Locke and Latham 2013). Research has suggested that people perform better when they have goals that are specific, challenging and achievable. Goals should be challenging because this produces a high level of motivation and efforts expanded that subsequently enhance performance. Moreover, goals should be specific because this enables people to monitor their progress and adjust their performance as needed (Locke and Latham 2013). Building on these insights, firms have moved away from routine adjustments to their targets and adopted stretch goals to boost performance (Collins and Porras 1994, Takeuchi et al. 2008, Thompson et al. 1997). Stretch goals are defined as extremely difficult goals "with an objective probability of attainment that may be unknown but are seemingly impossible given current capabilities" (Sitkin et al. 2011: 547). Moreover, because of their extreme novelty, individuals generally lack appropriate insights about effective ways for achieving stretch goals (Sitkin et al. 2011).

Because of their extreme nature, stretch goals have been suggested to "mandate creativity and assumption-breaking thinking" (Rousseau 1997: 528) and spur exploratory behavior of individuals. They may not be achieved simply by working harder but instead they require extended efforts and the invention of new ways of doing business to achieve their purpose (Rose 2012). Using stretch goals may alter employees' perception regarding their routine jobs and motivate them to think in fundamentally different and innovative ways (Locke and Latham 2006).

They require individuals to think "out of the box," pushing those who are less expert in certain fields towards personal development in areas outside their comfort zone (Kerr and Landauer 2004), which allows for faster cycles of trial-and-error learning (Argyris 1985). This perspective suggests that stretch goals may provide a clear path to innovation and improved performance.

Although the practice of using stretch goals has been suggested to improve performance, scholars have argued that establishing them may not uniformly translate into higher performance (Sitkin et al. 2011, Thompson et al. 1997). For instance, recent insights indicate no significant main effect of stretch goals on performance (Gary et al. 2017). Rather than helping employees to move beyond their routines and to insist on achieving seemingly unattainable targets, stretch goals may actually cause a sense of collective fear and helplessness among employees because of the high probability of failure (Sitkin 1992, Zhang and Jia 2013). They may make information processing disorganized, more impulsive, and less systematic, and therefore, may inhibit rather than support learning and the incorporation of new approaches (Sitkin et al. 2011). In addition, Zhang and Jia (2013) found that stretch goals can foster unethical behavior and intensify relationship conflicts among employees. Taken together, empirical evidence against the use of stretch goals has emerged and shows that just stretching targets will not guarantee success.

Scholars, therefore, started highlighting important contingencies explaining when organizations may benefit or suffer from the use of stretch goals. For

instance, Sitkin et al. (2011) suggested that stretch goals may only be effective within organizations that have celebrated recent successes or have uncommitted resources available for discretionary use. Others have argued that structural arrangements and a justice climate may mitigate potential disruptive effects of stretch goals (Thompson et al. 1997; Zhang and Jia 2013). Although these insights highlight key conditions under which stretch goals may boost performance, they represent a small few of the potential contingencies that may affect the efficacy of stretch goals. Importantly, research has not explored the salience of individual effects – for whom within a given organization will stretch goals affect behavior and performance? In this study, we not only investigate both the intended and unintended consequences of stretch goals in nurturing idea generation behavior but also identify and examine how individual-level contingencies such as individual-level prior success, organization tenure and hierarchical position may effectuate the usage of stretch goals on the generation of potentially useful ideas for new business opportunities.

3.4 Hypotheses

3.4.1 Stretch goals and Idea Generation Behaviors

Since innovation involves the crafting of creative ideas into new products, processes or services (Mumford et al. 2012), firms frequently encourage such activities especially among employees for whom innovation is not their primary role (Hansen and Birkinshaw 2007, Roper et al. 2008). When service employees

are assigned goals focused on the generation of new business opportunities, they have to engage in novel tasks beyond their main responsibilities for customer interactions and service delivery (Hartline and Ferell 1996). Because service employees are generally not required to identify opportunities for expanding business and generating new revenue streams, the usage of goals related to these aspirations may thus pose substantial cognitive and motivational challenges (Harvey and Kou 2013). To enact the stretch goal related to identifying new business opportunities, service employees need to be comfortable with or even enjoy identifying opportunities for new business development. Because of perceived incompatible job expectations, service employees may however experience pressure and stress when doing so (Coelho et al. 2011).

When firms start using more difficult and novel goals to encourage the generation of ideas for new business opportunities, they may alleviate hesitation among service employees, encouraging efforts to discover new possibilities through experimentation, broad search and playfulness (Sitkin et al. 2011). Stretch goals, therefore, support service employees to try out new approaches to participate in idea generation behaviors by identifying possible synergies between delivering services and identifying new business opportunities (Jasmand et al. 2012, Rousseau 1997, Yu et al. 2013). The difficult and novel nature of stretch goals may push service employees to think beyond their routine tasks and expand beyond their comfort zones in order to look for opportunities to serve existing or new customers in enhanced or novel ways. Moreover, stretch goals may also

trigger service employees to engage more intensely in idea generation behaviors. Seemingly unattainable targets may encourage service employees to expand additional efforts in fulfilling stretch goals and to generate multiple ideas for new products or service offerings (Kerr and Landauer 2004). Thus, we not only argue that stretch goals encourage service employees to participate in idea generation behaviors registering at least one idea for a new business opportunity, but also to engage more intensely in such behaviors by offering more of those ideas.

Hypothesis 1a: Stretch goals are positively related to whether service employees participate (submit at least one idea) in idea generation behaviors

Hypothesis 1b: Stretch goals are positively related to whether service employees engage (submit multiple ideas) in idea generation behaviors

3.4.2 **Stretch goals, Fruitful and Futile Ideas**

While stretch goals may increase motivation and trigger service employees to participate and engage in idea generation behaviors, we believe that this increased motivation will not always be directed towards beneficial outcomes, meaning that stretch goals may result into both intended as well as unintended outcomes (Gary et al. 2017). On average, we argue that the push to increase the participation and engagement of service employees in idea generating behaviors will likely supersede efforts to control quality, meaning that service employees will have neither the motivation nor the ability to discern between fruitful and futile ideas. Futile ideas are ultimately rejected as useful new business ideas

because they suffer from issues around technical feasibility, misalignment with the organization′s overall strategy, or a perceived a lack of demand. While some amount of unsuccessful submissions is to be expected, significant increases in futile submissions creates a potential cost for organizations who need to review the ideas and for employees who expend resources submitting the ideas. We believe that stretch goals will be particularly likely to result in an increase in both fruitful and futile suggestions for two reasons.

First, despite the fact that stretch goals may encourage service employees to engage in idea generation behaviors and to submit more ideas about new business opportunities, large attainment discrepancies may undermine the commitment of service employees towards the goal set if they come to believe that the goal is not attainable (Hollenbeck and Klein 1987). In this respect, earlier research has suggested that the extremity of stretch goals may dampen employee morale because they judge their attempts to reach those targets to be risky and involving failures (Sitkin et al 2011). Rather than being inclined to reach the stretch goal, service employees may focus attention on those aspects of the stretch goal that seem to be more easily attainable (Sitkin 1992, Van den Bos and Lind 2002). Hence, seemingly unattainable targets may be eroded to something more attainable such as generating a higher number of ideas for new business opportunities without considering whether they or useful or not (Mezias et al. 2002). When setting unusually high aspirations, firms may stimulate their service

employees to prioritize the *number* of ideas being generated rather than their *usefulness* for the organization. It may result into having a larger number of ideas "in the pipeline", in the hope that some of them are deemed to be useful by the organization (Pierce and Aguinis 2013).

Second, the usage of stretch goals may result in more impulsive and less systematic information processing within service units (Sitkin et al. 2011). When goals are perceived to be very difficult, service employees tend to focus only on goal-relevant activities, and become less willing to express their opinions and to participate in exchanges with others (Bazerman et al. 2000). In considering alternative ideas for new business opportunities, for example, service employees may therefore feel less able to match the complexity and demands of incorporating new approaches or inputs that could lead to potentially viable options for new growth opportunities. While shifting attention to attaining stretch goals is generally positive for exploration and getting out of the comfort zone, the extreme difficulty of pursuing them can lead service employees to focus attention too much or too haphazardly on outside ideas (Sitkin et al. 2011). This limits their ability to discern useful opportunities from useless ones in advance, simply because the opportunity has not been developed within the strategic framework of the firm. We thus argue that stretch goals will lead to more ideas being generated about new business opportunities, however, together with the lack of effective discernment

induced by stretch goals cause the submission of more futile opportunities as well as fruitful ones.

Hypothesis 2a: Stretch goals are positively related to the generation of fruitful ideas for new business opportunities by service employees.

Hypothesis 2b: Stretch goals are positively related to the generation of futile ideas for new business opportunities by service employees.

3.4.3 Shaping the Effectiveness of Stretch Goals on Idea generation Outcomes

Although stretch goals may lead to both intended as well as unintended outcomes, we identify three contingencies that may affect an individual's ability to generate and discern between fruitful and futile opportunities, in order to explain better what allows for extracting value from the potentials of the stretch goals: individual prior success, organizational tenure, and hierarchical position. Prior success indicates whether a service employee has been successful in generating fruitful ideas in the past. Organizational tenure refers to the length of his or her employment in the firm. Finally, hierarchical position indicates the position a service employee occupies within the hierarchy of the organization.

3.4.4 The Moderating Role of Individual-level Prior Success

Having experienced recent success in generating one or more fruitful ideas for new business opportunities, we argue that service employees have gained valuable and relevant experience in transforming stretch goals in desired outcomes. Stronger recent performers are less likely to feel threatened by the extreme difficulty and novelty of a stretch goal. They will be more open to new

ideas and are more skillful in scanning and processing goal-relevant information, which foster learning (Levitt and March 1988, Weick et al. 2005). This eventually boosts future individual performance in two forms, by coming up with more fruitful ideas and by being able to discern and judge the usefulness of ideas in order to abandon futile ideas before submitting them. Learning theory suggests that the successful outcome of prior activities results in increased repeated efforts and in new initiatives taken, which can boost behavioral outcomes when repeated efforts are needed (Deichmann and Van den Ende 2014).

Prior success may also improve perceived self-efficacy of service employees (Lee and Farh 2004) and, as a result, they feel more capable of learning new approaches and gathering information systematically (Tierney and Farmer 2002). With the experience of having had prior success, service employees are less likely to feel overwhelmed by seemingly unattainable demands involved, and are less likely to resort to hypervigilant and frantic information processing that may disrupt their learning approach (Sitkin et al. 2011). Therefore, we expect service employees who have experienced recent success to perform better in terms of mitigating potential drawbacks of stretch goals, and to be more effective in discerning fruitful from futile ideas for new business opportunities. All in all, their prior success can make these service employees more able to deal with stretch goals, because of accumulated knowledge and skills about how to identify useful ideas, but also in terms of filtering of unproductive possibilities which may thus boost the effectiveness of their idea generation behavior.

Hypothesis 3a: Prior individual success positively moderates the relationship between stretch goals and the generation of fruitful ideas for new business opportunities by service employees.

Hypothesis 3b: Prior individual success negatively moderates the relationship between stretch goals and the generation of futile ideas for new business opportunities by service employees.

3.4.5 The Moderating Role of Individual-level Organizational Tenure

Work experience is a preeminent driver of repertoires of behaviors (Boeker 1997, Datta et al. 2005) and encapsulates a multifaceted influence on cognitive and motivational processes (Guile and Griffiths 2001, Ng and Feldman 2010, Tesluk and Jacobs 1998). We argue that organizational tenure, or the number of years that service employees have been working for the firm, shapes the ability of service employees to effectively harness the potential value of their ideas for new business opportunities engendered by stretch goals. Due to the longer exposure to a variety of organizational challenges and possible solutions, organizational tenure increases the complexity of mental models and facilitates problem-solving processes of individuals (Klahr and Simon 1999, Mantzavinos et al. 2004). Moreover, through gaining work experience within the organization over time, service employees become more knowledgeable about their organization as a whole (Datta et al. 2005). In this sense, they gain a deeper understanding about organizational priorities and become more capable of decoding and comprehending strategic directions. With this enhanced understanding and problem-solving skills, service employees may not only make better sense of stretched goals, but also they are better equipped to discern between what is considered to be valuable and what is

not for the customers and the organization and therefore come up with more fruitful opportunities. Conversely, employees who are relatively new to the organization are less capable of decoding and comprehending strategy communications, goals, and other aspects of organizational priorities.

In addition, organizational tenure improves understanding of social knowledge, organizational values, and behavioral expectations (Chatman 1991). Service employees with a longer history in the organization are not only better connected to others but also know better what type of opportunities are more relevant to the organization. Their network of peers is crucial for learning from the best experiences of others and reusing knowledge gained by people in similar contexts. These networks provide them both with access to key tacit knowledge that may help them generate better ideas, and access sources of feedback that let them pre-screen ideas before submission. Finally, their stronger connections to the customers directly enriches their repertoire of customer knowledge and broadens the array of opportunities from which they can pick the most fruitful ones. While those who have been longer involved within the organization have developed a greater political savvy about various business issues, such as which organizational changes are feasible (Ng and Feldman, 2010), newer employees do not possess these. Therefore, it is more difficult for them to discern what opportunities at the end are possible to harness and as the goals become more stretched and they face the urge to put more effort, they may get involved with disorganized and

unsystematic search that stretch goals might impose that results in to suggesting futile opportunities.

> *Hypothesis 4a: Higher organizational tenure positively moderates the relationship between stretch goals and the generation of fruitful ideas for new business opportunities by service employees.*
>
> *Hypothesis 4b: Higher organizational tenure negatively moderates the relationship between stretch goals and the generation of futile ideas for new business opportunities by service employees.*

3.4.6 The Moderating Role of Individual-level Hierarchical Position

The position of service employees within the organizational hierarchy has important implications for how stretch goals are perceived and acted upon when generating potentially useful ideas for new business opportunities. For instance, higher ranked service employees typically have enhanced feelings of control over valuable resources and greater influence over others (Fast et al. 2009, Tost et al. 2013). In this sense, they feel less constrained by their task environment and are more likely to take actions consistent with the stretch goals in their unit (Galinsky et al. 2003). Being positioned higher within the hierarchy, service employees are triggered to activate goal-directed behavior, whereas the feeling of powerlessness may inhibit lower ranked service employees to do so (Keltner et al., 2003). As such, we expect higher ranked service employees to utilize more effortful approaches to move forward toward desired ends, even when the pathway for reaching targets is unclear. Compared to lower ranked service employees, higher ranked ones tend to resort to more means to reach their goals (Guinote 2007), and

therefore, we argue that they search more proactively for feedback from clients as well as other stakeholders within their organization (Seibert et al. 2011).

In addition to heightened perceptions of power, higher ranked service employees tend to perceive increased levels of self-efficacy (Pierce and Gardner 2004). Because of that, social cognitive theory suggests that higher ranked service employees may not only perceive their skills and capacity to be sufficient to reach excessively challenging targets but also persist in achieving them (Bledow and Frese 2009, Chen et al. 2000). They tend to create a deeper understanding about the usefulness of new ideas as perceived by customers as well as how potential ideas may fit with overarching organizational processes (Smith, 2014). On the contrary, service employees with a lower hierarchical position tend to worry more about potential inadequacies of stretch goals and to dwell on failures when trying to fulfill those (Bandura and Locke 2003). As such, we argue that higher ranked service employees are more likely to persist in understanding and assessing whether their ideas for new business opportunities are useful. Their persistence in achieving stretch goals enables higher ranked service employees to better discern between fruitful and futile ideas, and to become more competent in increasing the number of fruitful ideas while lowering the futile ones.

Hypothesis 5a: Hierarchical position positively moderates the relationship between stretch goals and the generation of fruitful ideas for new business opportunities by service employees.

Hypothesis 5b: Hierarchical position negatively moderates the relationship between stretch goals and the generation of futile ideas for new business opportunities by service employees.

3.5 Data and method

3.5.1 Empirical Setting and Data Collection

We tested our hypotheses with multilevel and multisource data about idea generation behavior of service employees at a Fortune 500 firm within the communication technology and services industry. During the last decade, digital transformation has urged the firm to search for new opportunities for growth and the improvement of its margins. Although the firm previously had a system for evaluating new opportunities suggested by employees, recent interest among senior management in generating ideas from service units led to the implementation of difficult and novel goals to encourage idea generation behaviors among service employees. Although service employees are mainly responsible for installing, maintaining, and upgrading equipment, their long-lasting relationship with customers provide them with unique and in-depth insights about what new products or services may create added value for customers in the future and what needs to be done to harness new business opportunities. Several informants who we interviewed verified that the goals created around idea submission could credibly be considered as stretch goals. One, for example, complained, " I cannot imagine to get even close to the [target]. This is just unrealistic. [Target], seriously? I guess they have no idea of what it takes to deliver [target]." Another noted the challenge, but didn't view it as impossible, noting, "Obviously this is a lot beyond what we did before, not at all an easy target

... but I think given the strong relationships with the customer and our competences, we can come up with many nice projects. I am quite positive about that." This suggests both that the context is appropriate to consider stretch goals, and that there would be significant variance in how difficult the goals were considered to be for the unit.

This study utilizes three data sources. First, one of the major sources of our data constituted the firm's database about all ideas generated about new business opportunities and registered by 10,655 service employees in 102 service units who were asked by senior management to take part in the identification of new business opportunities in 2015. Service employees with administrative duties and support staff who did not have the technical background or contact with customers were not asked nor included in our study. The 102 units represent all of the units in the firm that have permanent (as opposed to contract, part-time) employees. Second, we distributed a survey to measure the perceived stretch goal at service units to a random sample of 500 service employees in the service units. The number of surveys sent out was proportional to the size of each unit with a minimum of three and a maximum of fifteen surveys per unit. After several reminders, we received 380 completed responses. The survey was management-approved, which is why the response rate is relatively high. Third, we obtained information from the firm's human resource department and internally generated market reports to measure our moderating and control variables. To alleviate concerns about reversed

causality and because the stretch goal for generating ideas for new business opportunities had a window of twelve months, we used responses about the stretch goal at the beginning of the year and obtained all the ideas registered for new business opportunities within the system during the twelve months after the survey was sent. While many variables are measured at the unit level, the final level of analysis is the individual level, with one observation for each individual in the sample.

3.5.2 **Measures**

Individual-level ideas for new business opportunities. Because the firm used a formal system for registering and evaluating ideas for new business opportunities, we were able to collect rich information about how many ideas service employees registered into the system as well as whether or not those ideas were ultimately accepted for sale to customers. As noted in Appendix 3-A, most submissions involved new features or products that met customer needs and could generate new revenue for the firm. Based on the information provided in the database, we created four separate dependent variables that each provide distinct insight into submitted ideas. First, we coded a binary variable participation in idea generation behavior that indicated whether a given service employee participated by registering at least one new business opportunity (coded as 1) or not at all (coded as 0) in the system during the twelve months period. Second, we measured engagement in idea generation behavior by counting the number of ideas service employees registered in the system during the twelve months period (for those that

submitted at least one). Third, we measured the number of fruitful ideas for new business opportunities registered by service employees in the system. To identify the number of fruitful ideas, we counted the number of registered ideas that proved to be useful since they were accepted and sold to customers. Fourth, to measure the number of futile ideas for new business opportunities registered in the system, we counted the number of ideas that were ultimately rejected by the organization. These suggested ideas for new business opportunities were rejected because of shortcomings as identified by the firm in terms of technical feasibility, (technical) alignment with the firm's strategy, the implementation in the market (i.e. because of regulatory issues) or a lack of perceived demand.

Individual-level prior success. We measured prior success of service employees in generating fruitful ideas for new business opportunities through a binary variable that was coded as one (1) if the service employee had registered at least one fruitful idea in the previous year and zero (0) otherwise.

Individual-level organizational tenure. We measured individual-level organizational tenure of service employees by counting the number of years the specific person had served at the firm.

Individual-level hierarchical position. We measured hierarchical position of the service employee by counting the number of layers below that individual in the hierarchy of the service unit. The higher the number of layers below, the higher the service employee was ranked in the hierarchy.

Unit-level stretch goal. Our interviews revealed that although goals were consistent within specific service units, they varied across service units in terms of perceived stretchiness. To measure stretch goal at the unit-level, we adopted a four-item, seven-point Likert scale from Zhang and Jia (2013). The items captured the perceived difficulty and novelty of the targets set at the specific unit related to generating new ideas for business opportunities. The specific items were: (1) I find that the goal in my unit is too high; (2) From the beginning, I think the work goal is too high to be achieved for my unit; (3) Within the extant resource and condition, I don't think we can accomplish the goal for my unit; and (4) According to the knowledge and expertise that I have, it's impossible for us to achieve this goal for my unit. First, the Cronbach's alpha was measured for stretch goal items at 0.84 which shows the internal consistency of the items. Before aggregating the responses of service employees to the unit-level, we examined interrater agreement and the intra-class correlation coefficients (Bliese, 2000; James et al., 1984). The average rwg(j) was 0.72 (median=0.76), ICC (1) was 0.24 and ICC (2) was 0.58. These agreement scores were within acceptable ranges and legitimated the aggregation of individual responses of service employees within the same unit for stretch goal.

Control variables. We controlled for confounding variables at both the unit- and individual-level of analysis in our models. First, we controlled for unit-level market size and market growth because when service employees operate within

units serving larger and growing may perceive to have more options to generate ideas about for new business opportunities. The measure for market size was taken from an internally used based on the number of users of telecommunication networks. Market growth was measured by the rate of growth of the users of telecommunication networks. We controlled for unit size and unit service performance because earlier research has suggested that contextual aspects such as resource availability may affect the extent to which units may benefit from stretch goals (Sitkin et al 2011). Unit size was measured as the number of employees within the service unit. Moreover, we used information from internal corporate records to control for the capabilities and resources available in the unit we included unit service performance by using the internally used measure in the firm. This measure captures the extent to which units addressed customer service requests satisfactorily and within the allocated contractual terms, including speed and customer satisfaction in delivering the requested service. Third, at individual level, we included the main effects for all of our moderator variables (prior success, organizational tenure and hierarchical position) and also controlled for gender (female was coded as 1; male was coded as 0) of service employees because of the importance of controlling for past performance and possible association of these variables with creativity and our outcome variables (George and Zhou 2007).

3.6 Analysis and results

Table 3-1 shows the descriptive statistics and correlations for all variables. While some correlations are relatively high, tests for multicollinearity showed that they did not pose a threat to the interpretation of the results reported (all the VIF values were below 1.8 and the mean VIF was 1.3). It is noteworthy that the number of fruitful and futile ideas were positively correlated, but at a relatively low level. Table 3-2 shows the results for service employees' idea generation behavior. Using multilevel logistic regression, Model 2 shows that stretch goal was positively and significantly associated with the likelihood that service employees participated in idea generation behavior (Wald $\chi 2 = 6.9$, $p < .05$, odds ratio = 1.23). Consistent with Hypothesis 1a, our findings show that with a one level increase in the perceived level of stretch goal, the probability that service employees started submitting at least one idea for a new business opportunity increased with 23 percent.

We used multilevel negative binomial regression to test Hypothesis 1b in model 4 of Table 3-2, which predicted that a stretch goal contributes to the engagement of service employees in idea generation behavior by suggesting more ideas for new business opportunities. The results show a positive, but marginally significant effect of a stretch goal on the engagement of service employees in idea generation behaviors ($\beta = 0.076$, $p < .10$). The expected number of suggested ideas increases by a factor of exp (0.076)= 1.078 (i.e. 7.8%) when the stretch goal increased one level. As a robustness check, we captured the engagement of service employees in

idea generation behaviors using a dummy variable that indicated whether a service employee registered more ideas after his or her first submission (coded as 1) or not (coded as 0) in the system during the twelve months period. Using a multilevel logistic regression, the results of the robustness check confirmed the earlier finding and revealed a marginally positive relationship between stretch goal and the engagement in idea generation behaviors by submitting more ideas after first submission. The pattern of findings regarding Hypotheses 1a and 1b indicates that – on average- a stretch goal primarily encourages more service employees to participate in idea generation behaviors rather than having them to become more engaged in such behavior by submitting more than one idea for new business opportunities. As shown in Table 3-3, we tested hypotheses 1b through 5b using multilevel negative binomial regression and estimating the models for fruitful and futile new business opportunities simultaneously. While negative binomial and poison regressions have been used for non-negative count dependent variables, the advantage of negative binomial is that it relaxes the assumptions related to mean equal to variance and the poison estimator's restriction on over-dispersion (Cameron and Trivedi 1998, Wooldridge 2002, see also Madson and Desai 2018, Jensen and Kim 2015). The results shown in models 1-3 relate to the number of fruitful ideas for new business opportunities as the dependent variable; models 4-6 relate to the number of futile ideas for new business opportunities.

Table 3-1 Statistics and Correlations

	Mean	SD	1	2	3	4	5	6	7
Individual level variables[a]									
1. Participation in idea generation behavior	0.35	0.47							
2 Engagement in idea generation behavior	0.93	2.24	0.56						
3. Number of Fruitful opportunities	0,37	1,37	0.36	0.72					
4. Number of Futile opportunities	0,56	1,57	0.48	0.79	0.15				
5. Gender	0,13	0,33	-0.02	-0.03	-0.01	-0.033			
6. Prior success	0,09	0,28	0.13	0.17	0.25	0.33	-0.02		
7. Organizational tenure	9,06	6,15	0.01	0.04	0.08	-0.01	-0.04	0.09	
8. Hierarchical position	2,68	0,90	-0.1	-0.07	-0.03	-0.08	-0.05	0.003	0.08
Unit level variables[b]									
1. Market growth	2.1	8.1							
2. Market size	4.5	1.7	-0.14						
3. Service performance	76.7	2.7	0.09	0.33					
4. Unit size	559	1710	-0.05	0.33	0.28				
5. Stretch goal	3.7	1.4	-0.15	-0.02	-0.006	-0.002			

[a] n=10,655 for all correlations above |0.02| ,p<0.5 , [b] n=102 , for all correlations above |0.2| ,p<0.5

As shown in model 2, and consistent with hypothesis 2a, we found a positive relationship between stretch goal and the number of fruitful ideas for new business opportunities (β=0.094; p< .05). The number of fruitful ideas increased by a factor of exp(0.094)= 1.098 (i.e. 9.8%) when the goal was perceived to be one level more stretched. In Model 5, we found that stretch goal is positively related to the number of futile ideas (β= 0.112; p< .05), which

Table 3-2 Service Employees Idea Generation Behavior [a]

	Participation in idea generation behavior		Engagement in idea generation behavior	
	Model 1	Model 2	Model 3	Model 4
Unit level				
Market growth	-0.009	-0.003	0.004	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Market size	-0.001	-0.004	-0.034	-0.035
	(0.05)	(0.05)	(0.02)	(0.02)
Service performance	-0.111***	-0.115***	-0.034*	-0.036*
	(0.03)	(0.03)	(0.01)	(0.01)
Unit size	0.00004	0.00005	0.00002	0.00002
	(0.00004)	(0.00004)	(0.00001)	(0.00001)
Stretch goal		0.214**		0.076+
		(0.08)		(0.04)
Individual level				
Gender	-0.19***	-0.19**	-0.06	-0.06
	(0.06)	(0.06)	(0.04)	(0.04)
Prior success	0.92***	0.92***	0.40***	0.40***
	(0.07)	(0.07)	(0.04)	(0.04)
Organizational tenure	0.001	0.001	0.001	0.001
	(0.004)	(0.004)	(0.002)	(0.002)
Hierarchical position	-0.04	-0.03	0.01	0.02
	(0.04)	(0.03)	(0.02)	(0.02)
cons	7.85***	8.11***	3.71***	3.77***
	(2.42)	(2.35)	(1.09)	(1.08)
Log likelihood	-6879	-6550	-7625	-7625
var(L1[unit])	0.46	0.43	0.07	0.07
	(0.09)	(0.08)	(0.02)	(0.02)
N	10,655	10,655	3819	3819

[a] Standard errors in parentheses, + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Table 3-3 The Number of Fruitful and Futile Ideas for New Business Opportunities[a]

Fruitful Ideas for New Business Opportunities			
	Model 1	Model 2	Model 3
Unit level			
Market growth	-0.02*	-0.01+	-0.01
	(0.01)	(0.01)	(0.01)
Market size	-0.07*	-0.08**	-0.08**
	(0.02)	(0.03)	(0.03)
Service performance	0.03**	0.03+	0.03+
	(0.01)	(0.01)	(0.02)
Unit size	-0.00006***	-0.00005**	-0.00006**
	(0.00001)	(0.00002)	(0.00002)
Stretch goal		0.094*	0.028
		(0.047)	(0.051)
Individual level			
Female	0.03	0.02	0.02
	(0.07)	(0.08)	(0.08)
Prior success	1.05***	1.03***	0.95***
	(0.06)	(0.06)	(0.07)
Organizational tenure	0.03***	0.03***	0.02***

	(0.004)	(0.004)	(0.004)
Hierarchical position	0.07*	0.12**	0.12**
	(0.03)	(0.03)	(0.03)
Cross level interactions			
Stretch goal X Prior success			0.21**
			(0.081)
Stretch goal X Organizational tenure			0.01*
			(0.005)
Stretch goal X Hierarchical position			-0.01
			(0.042)
cons	-2.4*	-1.6	-1.64
	(0.9)	(1.17)	(1.23)

Futile Ideas for New Business Opportunities

	Model 4	Model 5	Model6
Unit level			
Market growth	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)
Market size	0.08*	0.08*	0.09*
	(0.04)	(0.03)	(0.03)
Service performance	-0.11***	-0.11***	-0.10***
	(0.02)	(0.02)	(0.02)
Unit size	0.00007**	0.00007**	0.00003**
	(0.00003)	(0.00002)	(0.00006)
Stretch goal		0.112*	0.08
		(0.05)	(0.05)
Individual level			
Female	-0.07	-0.07	-0.07
	(0.06)	(0.06)	(0.06)
Prior success	-0.15**	-0.15**	-0.16**
	(0.06)	(0.06)	(0.06)
Organizational tenure	-0.01***	-0.01***	-0.01***
	(0.003)	(0.003)	(0.003)
Hierarchical position	-0.1**	-0.07*	-0.07*
	(0.03)	(0.03)	(0.03)
Cross level interactions			
Stretch goal X Prior success			0.03
			(0.07)
Stretch goal X Organizational tenure			0.006
			(0.004)
Stretch goal X Hierarchical position			-0.08*
			(0.03)
cons	7.54***	8.47***	7.82***
	(1.72)	(1.57)	(1.61)
Fruitful_lnalpha	0.25***	0.23***	0.21***
	(0.05)	(0.05)	(0.05)
Futile_lnalpha	-0.64***	-0.63***	-0.63***
	(0.05)	(0.05)	(0.05)
var(L1[unit])	0.02**	0.04**	0.07**
	(0.05)	(0.02)	(0.02)

[a]Standard errors in parentheses, N=3819, + p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Hypothesis 3a predicted that individual prior success positively moderates the relationship between stretch goal and the number of fruitful ideas for new business opportunities. We included the interaction between stretch goal and individual prior success in Model 3. We found a significant result for the interaction effect (β=0.21; p< .01), showing that the effect of stretch goal on the number of fruitful ideas increased by a factor of exp(0.21) =1.23 (i.e. the effect becomes 23 % stronger) among service employees with prior success. To test hypothesis 4b, we included the same interaction in Model 6, and found a non-significant relationship (β= 0.03; ns). The interaction effect between stretch goals and prior success on the number of fruitful ideas is plotted in Figure 1. The figure indicates that service employees who had been successful in the past in suggesting fruitful ideas, produced a higher number of fruitful ideas when the goal within their unit became stretched more.

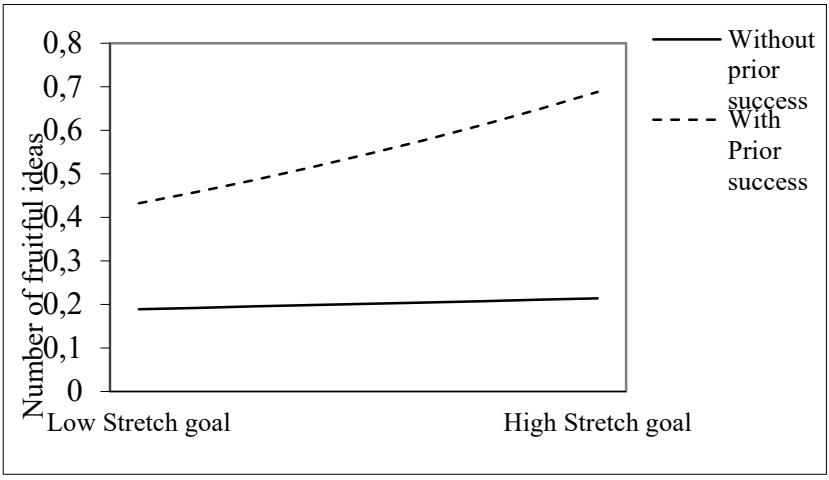

Figure 3-1 Interaction effect of stretch goal and prior success on fruitful ideas for new business opportunities

To test hypothesis 4a, we included the interaction effect between unit stretch goal and individual organizational tenure in Model 3. We found a significant relationship (β= 0.01; P<.05), showing that the effect of stretch goal on the number of fruitful ideas increased by a factor of exp(0.01) =1.10 (i.e. the effect becomes 10 % stronger) when individuals have one more year experience in the organization. To test hypothesis 4b, we included the same interaction effect in Model 6 and found a nonsignificant result (β= 0.006; ns). The interaction between stretch goals and organizational tenure is plotted in Figure 2 and indicates that service employees who had been with the firm longer have been able to submit a higher number of fruitful ideas for new business opportunities when their unit set more stretched goals.

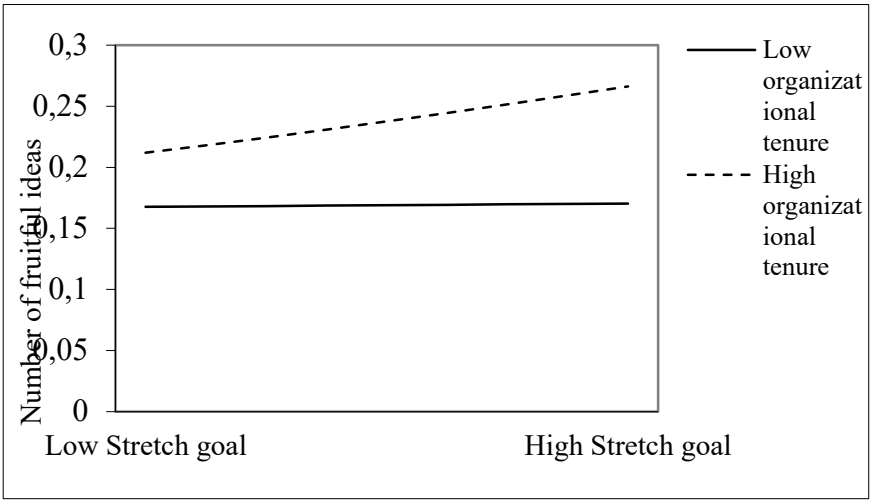

Figure 3-2Interaction effect of stretch goal and organizational tenure on fruitful ideas for new business opportunities

To test hypothesis 5a, we included the interaction effect between unit stretch goal and individual hierarchical position in Model 3. We did not find a significant relationship (β= -0.01; ns). To test hypothesis 5b, we included the same interaction effect in Model 6 and found a significant negative relationship (β= -0.08; P<.05). The effect of unit stretch goal on producing a higher number of futile ideas weakens by a factor of exp(-0.08) =0.92 (i.e. the effect becomes 8 % weaker) when a service employee ranked one level higher within the hierarchy. The interaction effect between unit stretch goal and individual hierarchical position is plotted in Figure 3. Having more difficult and novel goals, a service employee generates a higher number of futile ideas for new business opportunities when they

were positioned lower within the hierarchy. We will return to these results in the discussion section.

As a robustness check, we added the square of unit stretch goal to the models, but did not find any significant effects. We also considered the Poisson model, since either the Poisson or the Negative binomial regressions could be used in count models (Long 1997). We performed a goodness-of-fit test of the model in order to determine which data process was most appropriate. The test did not support using the Poisson model (P =0.0000). Moreover, the larger variance of our dependent variables compared to the mean and dispersion parameter, alpha, which is significantly greater than zero, suggested the appropriateness of using the Negative binomial model for our over-dispersed dependent variables.

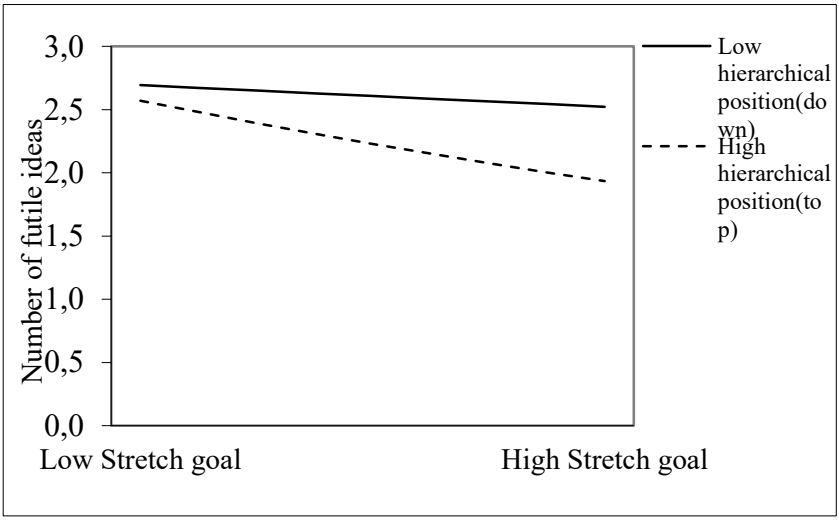

Figure 3-3Interaction effect of stretch goal and Hierarchical position on fruitful ideas for new business opportunities

3.7 Discussion and conclusion

This study sought to unpack how stretch goals affect both the behavior of employees in terms of suggesting new ideas, as well as the quality of ideas submitted. Our theory suggested that stretch goals could increase both participation (whether an employee submitted an idea) and engagement (how many ideas they submitted), though our results suggested that the effect on participation seemed stronger than that on engagement – stretch goals primary seem to function by encouraging marginal contributors to participate. We also suggested that stretch goals, while increasing the volume of suggestions, wouldn't necessarily increase the quality of those suggestions, a theory generally supported by the results. Instead, our theory on the importance of quality discernment by the employee suggested that stretch goals would only increase the submission of fruitful new ideas for employees with significant capabilities and knowledge – those who had submitted ideas in the past, those with substantial organizational experience, and those with senior positions in the hierarchy. Our empirical analysis focused on a multilevel contingency model with unique and detailed data on individual behavior within multiple units of a single company.

Stretch goals are inherently paradoxical – the establishment of aggressive targets may enhance performance by encouraging employees to search for novel solutions and increase dedication (Sitkin et al. 2011), and at the same time setting extremely challenging goals may lead to unintended negative consequences (Zhang and Jia 2013) that actually diminish performance by discouraging employees. Instead of

looking only to understand the aggregate effect of stretch goals on unit or firm performance, our study provides a unique, multi-level opportunity to theoretically and empirically decompose the effects of stretch goals at the individual level, examining both the behavior encouraged by stretch goals and the types of employees for whom stretch goals may be most useful. Although earlier research has alluded to the idea that stretch goals may support behavioral change within organizations (Sitkin et al. 2011), our study implies that future research should make a distinction between whether employees participate in certain behaviors and whether they engage in doing so. We offer three important theories and findings that inform future research on stretch goals.

First, stretch goals encourage both participation and engagement, but have a far stronger effect on participation. This suggests that the primary benefit of stretch goals is to encourage employees that didn't previously invest significant effort to take the goals seriously. This distinction between participation and engagement alone may help explain the previous mixed findings on the aggregate value of stretch goals.

Second, we theoretically highlight (and empirically show) that stretch goals primarily work on motivation, increasing the motivation to contribute ideas. However, these goals do not seem to provide employees the ability to discern which ideas are worth submitting, and may even encourage employees to submit any ideas irrespective of quality. The result is that the volume of useful and useless

ideas rises, uncovering new useful ideas but also creating work to sort through suggestions. This suggests that, if the average behavioral response to a stretch goal generates positive outcomes (potentially because the task is easy), then stretch goals will bring significant benefits to the firm. Stretch goals around more challenging tasks (e.g., radical innovation) may result in wasted resources.

Finally, stretch goals will largely be beneficial for employees who already possess the potential to know a good idea from a bad one – based on their previously demonstrated capabilities, their organizational experience, and their level of seniority. Most significantly, we found that lower level employees confronted with stretch goals were likely to significantly increase their submission volume of poor ideas without any increase in good ideas, suggesting that pushing stretch goals on very junior employees may be particularly bad for performance. Moving beyond the notion that stretch goals may have uniform effects on behavioral and performance outcomes (Gary et al., 2017), this suggests again that the aggregate benefits or costs of stretch goals depends crucially on the types of employees being pushed through stretch goals, and their ability to discern behavior that will be beneficial from behavior that will not be helpful. This helps out theoretical understanding move beyond macro-level contingencies such as slack resources and structural arrangements that shape the effectiveness of stretch goals (Sitkin et al. 2011, Thompson et al. 1997) to understand the individual contingencies affecting the effectiveness of stretch goals within organizations.

4 Study 3- Strategizing for Emerging Technologies: The Role of Motivation and Ability in Shaping Managers' Preferences for Timing of Investment

4.1 Abstract

This study proposes perceived capability and motivation, as important determinants of managers' preference for the timing of investment on an emerging technology. In this study, both the conditions under which and the mechanism through which timing of manager's investment decision is shaped are examined. First, by considering motivation as an important contingency to the perception of capability gap, this research explains how combination of motivation and capability gap determine whether managers delay investment in emerging technologies. Moreover, the study posits exploration approach as an important underlying mechanism that links the joint effects and the manager's timing of the investment decision. A moderated mediation framework is tested using data from managers in health care sector faced with Internet of Things (IoT) in an experimental setting and discuss how the findings advance strategic decision-making and behavioral strategy research.

Keywords: Exploration, capability gap, regulatory focus, timing of investment

4.2 Introduction

In recent years managers have been increasingly confronted with the emergence of new digital technologies that introduce new opportunities as well as competitive threats and challenges to the existing organizational knowledge base and activities. Given the complexity of technological change and various ambiguities about the scope and the speed at which the implications arise (Santos and Eisenhardt, 2009), strategy scholars and practitioners seek to understand why some organizations are more successful than the others in dealing with such technologies (Henderson and Clark, 1990; Rosenbloom, 2000; Royand Sarkar, 2016). Scholars suggest that an important determinant of successful response to new technologies is managerial decision on resource allocation and investment (Eisenmann, 2006; Ritchieand Melnyk, 2012). Investment decisions on new technologies are greatly influenced by the biases of the managers (Eggersand Kaplan, 2009) because such decision-making situations are difficult to analyze and open to interpretation. Managers face the dilemma in investment decisions because both early and late investments in emerging technologies have the potential to be detrimental or beneficial to organization's performance (Eggers, 2014). On the one hand, early investment provides sources of competitive advantage and allows timely acquisition and assimilation of knowledge (Helfatand Raubitschek, 2000; Nehrt, 1998), but it may also give rise to the risks of an early bet. On the other hand, later investment and decision to wait may avoid making inefficient investment and reduce the risk but will hamper the building of important

knowledge, putting organization at a disadvantage vis-à-vis the competitors who adopted the technology earlier (Cohen and Levinthal, 1990).

Prior research has extensively used a capability lens to examine responses to emerging technologies on the assumption that organizational capabilities (Barney, 1991; Kogutand Zander, 1992; Teece, Pisanoand Shuen, 1997) shape strategic preferences of managers and, thereof, effectiveness of organizational response to such technologies (Capron and Mitchell, 2009; Lavie, 2006). Although a capability lens can provide important insights for understanding how organizations respond to technological change, recent scholarship proposes that such understanding is incomplete without adding a motivation lens to it (Foss, 2011, Zhao and Chadwick, 2014, Osterloh and Frey, 2000; Dahlin et al., 2018; Eggers and Kaul, 2018). From another point of view, we know that, in the face of an exogenous change, motivational drivers are important determinants of strategic decisions (e.g., Gilbert, 2005; Julian and Ofori-Dankwa, 2008). However, despite the importance of motivation for innovation (Sauermann and Cohen, 2010), there are very few studies that complement organizational capability lens with motivation (Zhao and Chadwick, 2014; Eggers and Kaul, 2018). The notable exception is the work of Eggers and Kaul (2018) that considers motivation at the organization level and as an outcome of the decision, leaving the study of motivation of individual decision-makers and their inclinations as a driver of managers' decision for future research.

To further advance this agenda in the strategic management field, this study considers both the capability and motivation as the drivers of managers' preferences of the timing of investment in emerging technologies. For this, the focus is on the managers' perception of the organization's capabilities as well as the organizational context that influence the motivation of the managers to examine their impact on preference of the managers' timing of investment in an emerging technology. Concerning capability, this study follows the prior research that considers capability gap, i.e., the gap between existing capabilities of the organization and what would be needed in the new technological context, and the manager's perception of such a gap, which is a key determinant of the response to technological change (Capron and Mitchell, 2009; Lavie, 2006). With regards to motivation, the regulatory focus theory (Higgins, 1998) is used for its central role in strategic preferences of managers (Gamache et al., 2015; Ahmadi et al., 2017). This study provides argumentation that manager's regulatory focus acts as a moderating mechanism for the effects of capability gap. In addition to discussing the direct relationships, the study, through exploratory approach, goes further to identify an important countervailing mechanism (Aguinis, Edwards and Bradley, 2017) and explains how the indirect effect works in the opposite direction of the direct effect. Empirically, experimental data from managers active in healthcare sector who participated in a hypothetical decision-making scenario about adoption of IoT technology is used to investigate how managers who receive different motivational treatments respond to the change differently.

This research seeks to contribute to the strategy and organization literature. First, it contributes to the research on strategic decision-making (e.g., Kiss and Barr, 2015; Maitl and Sammartino, 2015; Laureiro-Martínez and Brusoni, 2018) by identifying relationships between individual and the contextual factors, which in combination determine managers' strategic preferences in timing the investment. From the perspective of behavioral strategy, the study illuminates important psychological factors that determine the underpinnings of organizations' response to the changes in the environment. Prior research emphasized the role of emotional factors such as envy (Nickerson and Zenger, 2008), emotional commitment, and a wide range of other emotional traits of CEOs (Delgado-Garcia and De La Fuente-Sabate, 2010; Hodgkinson and Healey, 2011). This study extends beyond this literature by uncovering the role of regulatory focus in shaping the managers' preferences for specific strategic tendencies in face of an emerging technology, particularly the orientation towards exploratory behavior and tendencies for delaying the investment.

Second, this study seeks to contribute to the stream of research that investigates exploration-exploitation trade-offs at individual decision-makers' level (e.g., Mom et al., 2009; Mom et al., 2015) by looking at the exploration orientation as an important link between contextual factors and strategic decision-making preferences of managers with respect to timing of investment. By illuminating that emerging digital technologies have properties that increase the

importance of managers' exploration orientation, this study identifies such inclinations as the key mechanisms that link individuals' perceptions and motivation with concrete decision-making outcomes.

Third, this study extends the recent work in behavioral strategy that focuses on motivation and capability (Eggers and Kaul, 2018) as two underpinnings of strategic behavior and investigates these influences at the level of individual decision-makers. While moving away from an aggregate level is pertinent for understanding the success and failure of organizations in the face of digital technologies (e.g., Vuoriand Huy, 2016), this research seeks to uncover the factors that influence strategic decision-making of the managers and provide insight into decision-making at the individual level.

4.3 Timing of the Investment Decision

Strategic decision-making includes the fundamental decisions which affect the course organizations will take (Eisenhardt and Zbaracki, 1992), and eventually influences the competitive advantage of an organization (Rumelt, Schendel and Teece 1991). Sound and thorough strategic decision-making is one of the key sources that leads to higher organization performance (Baum and Wally, 2003; Eisenhardt, 1989). One of the most important strategic decisions of managers relates to responses to the technological changes. Investigating timing of decisions has been an interesting subject for scholarly research in strategic management as organizations can use time to gain competitive edge (Bakker & Shepherd, 2017;

Kownatzki, et al. 2013; Luoma et al. 2017; Pacheco-de-Almeida and Zemsky, 2012). Timing of investment can be a powerful source of competitive advantage (Jones, 1993; Judge & Miller, 1991). Particularly in the high-velocity markets, speedy decision-making leads to superior performance (Eisenhardt, 1989; Nadkarni et al., 2016). By early investments, organizations can exploit opportunities before they disappear (Stevenson & Gumpert, 1985) and enjoy the first-mover advantages (Cool et al., 2012). The drawbacks of early investment in new technologies are however inefficiencies and frequent failures that may prove fatal for the organization (Danneels, 2004). Research has shown that decisions for launching products earlier or later can influence rivals' prospects (Luoma et al. 2017; Pacheco-de-Almeida and Zemsky, 2012); timing of investment decisions can influence competitive threats (Henderson and Cool, 2003), and delaying the responses to stakeholder pressures can deflect scrutiny (Raaijmakers et al., 2015).

When exposed to emerging technologies, organizations may need to adopt these technologies to sustain their competitive advantage over time (Jones, Lanctot and Teegen, 2001). Therefore, organizations need to invest sufficient resources promptly to optimally benefit from the new technology (Nehrt, 1996). Strategy and organization scholars increasingly emphasize the unique role played by managerial cognition and related mental processes on strategic decision-making (Helfat & Peteraf, 2014). The role of managers and their cognition have been acknowledged to aid in the explanation of strategic decisions (Donaldson &

Lorsch, 1983; Gary & Wood, 2011; Narayanan, Zane and Kemmerer, 2011; Wally & Baum, 1994). Eggers and Kaplan (2009) provide a detailed discussion about how managers' cognition matters in organizations' response to technological change, for example, by setting priorities and directing the attention of organizational members in making strategic decisions such as mergers and acquisitions and divestiture. In line with the recent strategic management research (Eggers & Kaul, 2018), this manuscript concurrently incorporates motivation and capability aspects in the theorizing. In considering both sets of factors, an individual level approach is adopted, and focus is on how manager's perception of capabilities and motivational aspects influence the manager's decision about the timing of investment regardless of the consequence of the decision in terms of performance.

4.4 Hypotheses

4.4.1 Perception of Capability Gap and Timing of the Investment Decision in Emerging Technology

Technological changes confront organizations with a gap between their current capabilities and the ones required to succeed under the new conditions (Capron & Mitchell, 2009). A gap in capability is defined as the distance between the collectively aspired value-maximizing capabilities of an organization and the organization's current capabilities (Capron & Mitchell, 2009; Lavie, 2006). While in emerging technological contexts the nature of the impacts and the subsequent capability gaps are uncertain, managers shape their perception of capability gap

that serves as the basis for their strategic decision-making (Lavie, 2006) in various, sometimes divergent ways.

A large capability gap may hint at a lengthy transformative path (Lavie, 2006). The possibility for missing the boats may create a sense of urgency or fear (Vuori & Huy, 2016), guiding the managers towards making quick investments. The company needs more time for narrowing the gap, so logically the sooner they begin, higher the chance of success. On the other hand, a large capability gap, which incorporates higher uncertainty may trigger an inclination to wait for the dust to settle, and to benefit from second mover's advantage (Liberman & Montgomery, 1998) by leveraging the learning and failures of others. In addition to that, an increased lack of fit of the existing capabilities and the required capabilities escalates the complexity of the problem for managers, and the complexity is known to trigger delayed investment decision (Raaijmakers et al., 2015). When the capability gap is perceived as a large one, the managers might see the situation as one that takes more time to resolve, given the numerous complexities, before any justifiable investment decision can be made. However, when the capability gap is perceived as small, they need less time to arrive at a decision.

Moreover, a large capability gap increases threat perception (Krunger & Dickson, 1994), which, in turn, results in inertial responses (Gilbert, 2005), such as deferring the investment and instead to strive to preserve the existing business.

The threat of cannibalization of existing sources of capabilities may also affect decision-making. Indeed when the path towards change is not smooth, time may be used as a source for buffering or action (Raaijmakers et al., 2015). Conversely, when the capability gap is small, although there may be only a limited sense of urgency, the problem at hand will be less complex, and the perception of the risks of cannibalization or the first-mover disadvantages will diminish.

Therefore, although there are some reasons to consider an opposite effect, overall it is reasonable to argue that when the capability gap is large, manager will favor a later investment than when the capability gap is small. Therefore,

H1: The larger manager perceives the capability gap, the later they prefer to investment on emerging technologies.

4.4.2 **The Interaction Between Capability Gap and Regulatory Focus**

This section will explain why and how the regulatory focus as a motivational driver and capability gap as an indicator of the ability are expected to interact and influence the preferences of strategic decision makers. In the previous section was discussed how a large capability gap may create inconsistent impressions for the decision-makers, potentially leading them to different decisions. Regulatory focus theory provides important insights into how managers react to a large versus small capability gap. Promotion and prevention foci "serve as a general reference point by which people view their world" (Johnson et al., 2015, p. 1504). Promotion focus is associated with more risk-taking, whereas

prevention focus is closer to risk-aversion and cautiousness (Grant & Higgins, 2003). Promotion focus encourages performance of acts of commission in response to perceived chances of gains and a risk-seeking bias, whereas, prevention focus encourages risk avoidance and avoidance of the errors of commission and performance of acts of omission in response to perceived chances of losses. (Crowe & Higgins, 1997).

According to the above discussion, a manager in a prevention focus condition will focus on the potential negative effects of an early versus late investment. An early investment in an emerging technology field is risky (Day & Schoemaker, 2000) and the chances of failure are high. In response to emerging technologies, prevention-focused managers whose motivational driver is loss avoidance (Kark, van Dijk and Vashdi, 2018) and their ability to focus on the potential opportunities for growth is limited (Tumasjan & Braun, 2012), are expected to get blindsided by the desire to avoid a failed investment. Therefore, a prevention-focused manager is, in general, less inclined to invest early on an emerging technology. In fact, when the prevention focus is the motivational driver of the decision-maker in facing large capability gap, they confront additional clues that indicate a large looming failure if an early investment is made in an emerging technology to deal with which the organization does not possess enough capabilities. In such circumstances, minimizing the risk of failure will entail delaying the investment decision, waiting for uncertainties to diminish, and

learning from the failure and successes of the others. It is noteworthy that prevention-focused managers are exposed to another type of risk and failure, that is being too late to invest. The way a manager is affected by these risks can be explained by the nature of regulatory focus, which tends to be time-dependent, meaning that promotion focus is more associated with long-term goals while prevention focus is more related to short term goals (Pennington & Roese, 2003). Because the failure of investment is imminent and failure because of lack of investment is unlikely to unfold in short-term, a prevention focus manager arguably focuses more on the perceived losses that are related to early investment than on the potential losses from late investment.

Conversely, when a manager is promotion-focused, and their driver of action is the desire to succeed, in dealing a large capability gap tends to focus on high-risk-high-return nature of an investment in an emerging technology (Paik & Woo, 2017) and feels motivated to invest early. Focus on the gains and future success and maximal goals guides the promotion-focused manager to invest. The long-term nature of promotion focus (Pennington & Roese, 2003) helps the manager to envisage the long-term future benefits of being successful in an emerging technology, even though the capability gap is large, and increases the manager's inclination to ignore the short term profits that delay in investment may bring about. Moreover, promotion focus compensates the lack of self-efficacy that is associated with a large capability gap (Tumasjan & Braun, 2012). Therefore,

promotion focus favors an even earlier investment decision. In fact, when the decision maker's attention is primarily focused on maximal goals in promotion-focused condition (Higgins et al., 2001) such as maximizing the return; in high-risk-high-return decisions (McMullen, Shepherd and Patel, 2009), a large capability gap encourages the manager much more to further consider the effective strategies towards maximal gains from closing such large gap and ignoring the potential risks. This approach is likely to guide a manager to invest earlier to benefit from the early movers' advantages such as the ability to command a larger market share or a higher price (Mikado, 1998). Therefore, it is argued:

H2: Regulatory focus moderates the relationships between capability gap and timing of investments in such a way that managers in promotion focus context will favor earlier timing when facing large capability gaps as compared to managers in prevention-focused context.

4.4.3 **The Mediating Role of Exploration Orientation**

The relationships that we discussed in the previous section were focused on the investment decision biases of managers when facing different capability gaps and different motivational contexts. In this section, we discuss an alternative mechanism that links capability gap and motivational context with the decision on timing of investment. When the degree of uncertainty is high, the path towards success becomes ambiguous (Amit and Schoemaker, 1993) and, therefore, managers may address the problem at their hand in multiple ways (Eisenhardt,

1989). In other words, the choices of managers may vary, and this variation influences their timing of investment. Emerging technology evokes a wide spectrum of possible responses to capability gaps. (Dattée et al., 2018) The responses range from a strong focus on exploitation response by acquiring familiar capabilities that are contiguous with the existing capabilities of the organization to a strong focus on exploration orientation that leads to obtaining and developing an unfamiliar set of capabilities and venturing into uncharted waters.

One end of the spectrum is related to responding to capability gap by focusing on expanding or renewing the existing capability-set of the organization and developing or acquiring new sets of capabilities (Yamakawa, Yangand Lin, 2011), even those capabilities are not embedded in the existing set of capabilities and routines of the organization. Managers with such inclinations tend to push their organization outside its comfort zone (Andriopoulos and Lewis, 2009) to develop competencies and routines that are required for overturning their product architecture (Teece, Pisanoand Shuen, 1997) and deviating from the current best practices and ways of working (Sorenson and Sorenson, 2001). This approach that represents exploration is beneficial for achieving first-mover advantage by developing a breakthrough innovation and safeguarding the organization against disruptions that may come from competitors and new entrants.

The other end of the spectrum is related to maximal preservation of the existing capabilities and reallocating or redeploying the existing resources to take

care of the new technology. Managers with such inclinations will focus on a selective set of activities that are within the comfort zone of the organization and existing capabilities to maintain the architecture of their products but add novel functionalities to them whenever possible. This approach that represents their exploitation orientation is beneficial for safeguarding existing business from cannibalization without a need to engage in ambitious and bold initiatives that may take the organization in very different directions from its current path.

When the capability gap is small, naturally the exploitative approaches become highly relevant as the current capabilities of the organization and those capabilities that are required to be successful in the emerging technology are not too far away from each other. In the condition of large capability gap, motivational context becomes increasingly influential, as we will explain in the following paragraphs. In a neutral motivational context that neither emphasizes on promotion nor on prevention, both exploratory and exploitative options could be attractive for managers faced with a large capability gap. This is because each approach has some advantages and some potential drawbacks. The true merit or the demerit of either approach becomes more apparent as the emerging technology evolves and the reality unfolds. However, in presence of motivational context, managers may become more (or less) inclined to one or the other of the two ends of the spectrum of options.

When a manager is under the influence of prevention focus, the larger the gap is perceived to be, the less likely is the to attempt for exploratory approaches to realize the potential of the new technology. This is because such a decision-maker prefers to focus on loss avoidance as the goal. When he sees that the current capabilities of the organization are widely deviating from the required capabilities, under the influence of the prevention focus, the manager strives to minimize the chances of failure. Therefore, the manager is more inclined towards exploitation because this approach keeps the organization within its comfort zone in which the chances of failure are much smaller than when attempting exploration that takes the organization way out of the comfort zone. For example, for a prevention-focused manager faced with a large capability gap, an attempt to develop the current capabilities for adding a basic wireless connectivity to the existing products, compared to developing very new capabilities to redefine the products to make them smart for using the Internet of Things, seems less likely to fail. Hence, a prevention-focused decision-maker will be more inclined to consider safer, exploitative approaches to close large capability gaps. Conversely, a decision-maker in a promotion-focused context would be more inclined towards maximal goals that are unlikely to be realized without major improvements. The larger they perceive the gap, such managers are more likely to find more appealing a very new approach. Being focused on maximal goals, for example, they are expected to find the gains from developing a novel capability that could serve as a digital platform to be much higher than from just adding a simple capability close to their current

capabilities which allows minor connectivity to existing products. Hence, promotion-focused managers facing a large capability gap are more oriented towards exploration.

Up to this point, the relation of the motivation and capability gap with the choice between exploration and exploitation approaches have been described. Now, going a step further, the reason for the influence that exploration and exploitation approaches have on the timing of investment decision will be discussed.

The exploitative approach that closes the capability gap by developing the current capabilities in the areas that are familiar and close to the current capabilities of the organization is much more straightforward for implementation, unlike the exploratory approach. In contrast, an exploratory approach to filling the capability gap entails going far from the comfort zone and a farther and broader search, examination of different, unfamiliar alternatives. Therefore, the exploratory approach does not present a clear and vivid path.

Further, closing the capability gap (exposed by an emerging technology) via the exploration path, calls for consideration of several points including monitoring the strategic activities in the emerging ecosystem (Gawer and Cusumano, 2014), making new alliances and ending exiting ones (Phelps, 2010), and careful evaluation of various aspects of the organization and its business model to ensure a coordinated organization-wide response (Taylor and Helfat,

2009). Hence, this fundamental approach towards addressing the capability gaps requires more time for information gathering, discussion, planning, and preparation and at the same time, waiting for the progress of the infrastructure technologies and different actors in the ecosystem. Therefore, such approach delays the investment. In fact, with a preference towards closing the capability gap with an exploratory approach, managers would need considerable time for planning and preparation before deciding to make the actual investment.

Promotion-focused managers, it may seem, are willing to invest earlier. However, the larger they perceive the capability gap to be; to achieve higher gains from such a risky investment (as we discussed in H2), they consider exploratory approaches that are time-consuming, more suited to address the capability gap. This inevitably causes them to delay the investment decision as we discussed in the beginning of hypothesis 3. In this way the combination of large capability gap and promotion focus directly reduces, but indirectly, through exploration, increases the time needed to invest in an emerging technology. Conversely, although a prevention-focused manager facing a wide capability gap is less inclined to make an early investment decision. Such a decision-maker finds exploitation approach for closing a large capability gap more in congruence with their understanding of the motivational cues and the perception of the capability gap. Hence, the combination of a prevention focus context and a large capability gap directly encourages managers to delay the investment (as discussed in H2), but

through exploitation approach creates a tendency for earlier investment. As a result of these plausible direct and indirect countervailing effects (Aguinis, Edwardsand Bradley, 2017) we argue that:

H3: The relationship between capability gap, regulatory focus, and the timing of investment is mediated by the exploration approach in such a way that, if the promotion focus triggers higher levels of exploration approach in dealing with larger capability gap, they also cause a preference for later investment.

Figure 4-1 illustrates the moderated mediation model that emerges from the previous discussion and the emergent hypotheses.

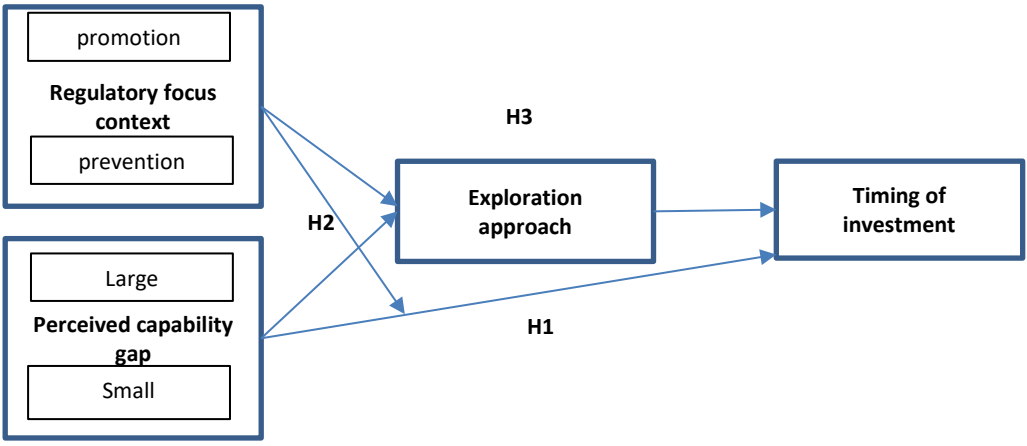

Figure 4-1 *The determinants of managers' preferences for timing of investment on emerging technologies*

4.5 Methods

While strategic decision-making research has not traditionally included experiments, recent work has shown how beneficial experiments can be in

investigating questions about the decision-making (Agarwal et al., 2010; Laureiro-Mart and Brusoni, 2015; Song et al., 2002). A major benefit of experimentation is that experiment boast higher internal validity of the conclusions drawn about the causal direction among the related variables (Campbell et al., 1966). This is especially important when studying strategic decision-making because numerous variables could influence the decision. In an experimental setting in which participants are randomly assigned to conditions, researchers have the advantage of holding all the variables, except the variable of interest, constant. Generally, the drawback of experiments is that external validity may be limited, in that generalizing from a laboratory environment to real-world settings is difficult. An acceptable balance has been struck between external and internal validity in this study by using a sample of professional decision-makers rather than using students, which is a common practice in experimental studies (Falk and Heckman, 2009).

4.5.1 **Research Context**

This research is conducted in the context of an emerging technology, "The Internet of Things." The term IoT was first used to describe how internet-connected devices would change society (Ashton, 1999). Radio frequency identification (RFID) and sensor technology eliminate the limitations of human-entered data by enabling computers observe, identify and understand the world directly. (Ashton, 2009). The combination of hardware and software would enable

systems to create, gather and transform data autonomously. The Internet of Things is a concept that connects a variety of things through wireless and wired connections, in which different things, objects or devices interact and mutually cooperate to provide information and create new applications or services. The Internet of Things is a concept that, should it come to full fruition, will result in smart environments that make devices more intelligent, efficient and effective (Vermesan et al., 2014). Healthcare is one of the most promising fields for IoT-applications. Experts believe that IoT-technologies can significantly improve healthcare services (Botta, Donato, Persicoand Pescapé, 2016). It will result in an improved system of collecting and delivering data among health-tech devices at a reduced cost (Botta et al., 2016). IoT-based healthcare monitoring devices will improve the access to patient's information and could result in more accurate and high-quality patient care by enabling simultaneous monitoring and tracking patient's data, collected by several connected devices, at any time and from anywhere (Hossain et al., 2016). All the data needs to be communicated, stored and analyzed to derive new business models and products, whereby IoT-technologies will become a major influence in the healthcare industry in the coming years and give rise to completely new ways of value creation (Cousin, Castillo-Hiand Snyder, 2015). To summarize, IoT in the healthcare industry refers to a set of communication technologies, interconnected applications, sensors, and devices and people that operate together with people, as a smart system to track,

store and analyze patient's healthcare information to enable high-quality and cost-efficient care.

4.5.2 Research Setting, Procedure, and Participants

An experimental vignette study was used to determine causal relations between the situational regulatory focus, the capability gap and the preferences of managers for exploratory activities, and from the outcome, the timing of strategic investment in emerging technologies. The use of experimental vignette study is appropriate for several reasons. Firstly, this method is suitable for assessing causal relationships and investigate differences among categories of independent variables and dependent variable (Aguinis and Bradley, 2014). Secondly, this method is most suitable for explaining human behavior and preferences in hypothetical scenarios (Aguinis and Bradley, 2014). The participants of this study consist of managers and senior professionals active in IoT health care sector. The participants were identified and recruited by advertising on the social media pages related to IoT healthcare companies in the Netherlands. When a person meets the advertised profile, an invitation to participate in this research is emailed to the person.

First, all the respondents are provided with the same baseline that explains the context of the study. Then each of the respondents is randomly assigned to a scenario. These scenarios are based on the dimensions of the variables "Capability gap" and "Regulatory focus." This results in the following four scenarios: 1)

prevention focus/small capability gap, 2) promotion focus/small capability gap, 3) prevention focus/large capability gap, and 4) promotion focus/large capability gap. Based on the vignette text, each respondent was asked to fill in their preference for choosing the exploration or exploitation approach and the timing of the investment and manipulation checks.

4.5.3 **Measures**

Manipulation "Situational Regulatory focus": For the manipulation of regulatory focus, two different situations were created by framing the context. Each participant was exposed to either a promotion-focused or prevention-focused context by being asked to read two distinct text explaining the situation (see Appendix 4-A). Emphasis was put on either: (a) positive outcomes, i.e., the consequences of succeeding in terms of major increase in the market share and revenues; or (b) negative outcomes, i.e., the consequences of failure in terms of major loss of market share and revenues. The sentences and length were kept consistent in both cases.

Manipulation "Capability Gap": Capability gap refers to the difference between the current set of capabilities of an organization and the set of value-maximizing capabilities in the post-change environment. The set of value-maximizing capabilities is an ideal type set of capabilities to create value and competitive advantage in the post-change competitive environment (Capron and Mitchell, 2009; Lavie, 2006). For the manipulation of the capability gap, each

participant received a written vignette sketching either a large or small capability gap for the organization (see Appendix 4-B). To enhance the external validity of this experiment and to create vignettes relevant to the role of managers, several steps were taken to design the vignettes. First, references of literature and industry reports about IoT were provided. Then, managers in the Information and Communication Technology (ICT), and experts in IoT in the ICT industry were interviewed to define the capabilities required for adopting IoT successfully. Use of various sources resulted in three main aspects which were covered in vignettes (i) knowledge and expertise in IoT, (ii) up to date technological systems, especially for dealing with large amounts of data and various privacy issues, and (iii) interoperability with other technologies and devices.

Mediator variable "Exploration/Exploitation approach": While there is no universal agreement about whether exploration and exploitation should be considered as opposite ends of a continuum or orthogonal variables, they are theorized and operationalized here as continuous variables. A bipolar scale, suitable for the trade-off nature of the exploration and exploitation decisions made by managers in a single domain is used (See Emmertand Barker, 1989; Gupta et al., 2006; Ahmadi et al., 2017). A modified measure was used for exploration orientation (Ahmadi et al., 2017) to match the decision-making context that managers would encounter in this experiment. For example, the items included: "It is more likely that I approve major deviation from the existing best practices and

known processes." versus "It is more likely that I ensure full compliance to the existing best practices and known processes."

"Timing of investment": To measure the timing of investment decision, we used an adapted scale of Baum and Wally (2003; 1994). Since investments in emerging technologies are expected to take longer because of uncertainty and unpredictability (Paapand Katz, 2004), this measure represents the moment from today on a five-year scale divided into monthly intervals into the future when one would invest, using. The five-year scale was also used in measuring the timing of compliance (Raaijmakers et al., 2014).

Manipulation checks: For the manipulation checks, at the end of the study, participants were asked to rate several statements. For the manipulation check of capability gap, in one statement they were asked if they see a large gap between the current competencies of the organization and the competencies that were needed to deal with the new situation. From Figure X it may be observed that A 2 (large capability gap vs. small capability gap) by 2 (promotion vs. prevention) Analysis of Variance (ANOVA) on manipulation check measure of capability gap yielded statistically significant main effects only for capability gap. A 2 (large capability gap vs. small capability gap) by 2 (promotion vs. prevention) ANOVA on manipulation check measure of regulatory focus also yielded statistically significant main effects only for regulatory focus.

4.6 Analysis and Results

Table 1 shows the correlations and statistics. Structural Equation Modeling (SEM) is used to test the moderated mediation model. The numbers on the path (Figure 4-2) will be used to test the direct, moderation, and mediation hypotheses. The numbers in parentheses indicate the indirect effect.

Results show that a higher capability gap is positively related to the timing of investment ($B = 7.3$, $p < 0.05$). The hypothesis 1 is supported, which indicates that managers who perceive a large capability gap prefer later investment in emerging technologies. The path from regulatory focus to timing of investment is in the expected direction ($B = 4.5$, $p < 0.1$). Hypothesis 2 concerning the interaction effect of capability gap and regulatory focus on timing of investment is supported ($B = -9.3$, $p < 0.05$) and shows that when managers are in promotion focus context, perception of larger capability gap triggers earlier investment as compared to when they are in prevention focus context. Hypothesis 3 stated that exploration approach would mediate the relationship between capability gap, regulatory focus, and decision on timing of the investment. The results showed that the managers who perceived larger capability gap in a promotion-focused context were more inclined to commit exploration in a trade-off between exploration and exploitation in a way that the indirect effect of capability gap and regulatory focus through exploration choice resulted into later timing ($B = 4.8$, $p < 0.05$).

What we also found interesting was the indirect effect of capability gap on timing. Managers who perceived larger gaps, in the absence of motivational clues, were less inclined to commit to exploration in a trade-off between exploration and exploitation. In a way that was the indirect effect of capability gap through the choice of exploration, which resulted into earlier timing of investment ($B = -5.8$, $p < 0.05$).

Table 4-1 Descriptive statistics and correlations

	1	2	3	4
1-Intensity of investment				
2-Timing of investment	-0.0082			
3-Exploration	0.1340	0.4730*		
4-Regulatory focus	0.1827	0.0674	0.1518	
5-Capability gap	-0.0731	0.0851	-0.0617	-0.0385

N= 104,*Correlation is significant at the 0.05 level.

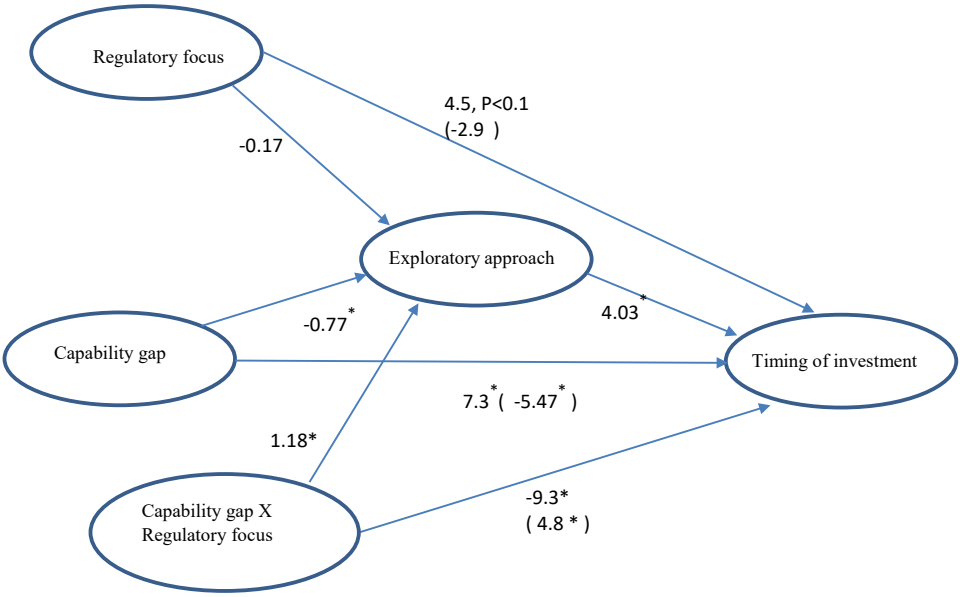

Figure 4-2 SEM model. Numbers in parentheses indicate indirect effects.

4.7 Discussion and Conclusion

Managerial preferences are important aspects of strategic decision-making and strategic behavior of the organizations in general, but particularly in the face of highly ambiguous and uncertain conditions such as those inherent in technological change. Under the conditions of ambiguity and uncertainty, interpretations and discretion of managers become more important, and the analytical approaches to decision-making become less relevant. The goal of this paper is to explore in greater depth the determinants of managers' preference for timing of investment in emerging technologies. To that end, a moderated

mediation model was developed and empirically examined. It explains how the distinct mechanisms of motivating contexts, perceptions of the managers, and strategic orientation of managers influence their investment preferences.

In H1, we developed the argument that a large capability gap generally discourages managers from early investment. The results showed that, indeed, in the absence of motivational considerations, early investment in an emerging technology is unlikely when the manager sees that the current competencies are far from the necessary competencies for success in implementing the emerging technology. Prior research suggests that when both the pace of change and the uncertainty of implementing the technology are high, a transformation path appears to be the most effective choice (Lavie, 2006). Closing the large gap requires substantially new coordinating processes, new task knowledge, new routines, or new complementary resources, which will require an innovating organization to invest in closing this "capability gap" and when the need for internal and external adjustments are high, the likelihood of adoption will diminish, but this will delay the investment. (McElheran, 2015). There are at least two likely and distinct reasons for this delay in investment. First, although waiting is costly, by waiting and observing the actions of those who decide to be early movers, the decision- maker might be able to acquire additional insights about the costs of investment and progression of the ecosystem to make a better investment decision (Zhang, 1998). Second, this delay may be preferred because of escalation

of commitment to prior investment that will be undermined by the investment in new technology (Tang, 1998). While the former reason is likely to be beneficial for the organizations, the latter reason may be detrimental by blindsiding the managers. Hence, it is important for managers to be aware of such cognitive biases and avoid the pitfalls of large capability gap in terms of being too late in the market and missing the early mover advantage.

In H2, the effect of capability gap under different conditions of motivation were examined. The results showed that managers in promotion-focused context are more encouraged to focus on the maximal ultimate gains to be had from closing the large capability gap. However, being promotion focused they focus less on the possibilities of failure because of such large gap and more on the possible future large gains. Therefore, they choose earlier investments. This is consistent with the ideas of organizational learning literature that posits both motivation and ability as pre-requisite of effortful learning activities by organizations (Reinholt et al., 2013). While several studies have looked separately into motivation and ability at individual, group, and organization level (See Dahlin, Chuangand Roulet, 2018 for a review), our study is one of the few that combine motivation and capability perspectives. This brings new insights to the understanding of the determinants of strategic decisions. Hence, if faced with large capability gaps, yet desiring the early mover advantage or influencing the dominant product design or securing a larger market share (Lieberman and

Montgomery, 1988), the organization would be better off by focusing on rewarding their managers for committing the resources at their command to the emerging areas. Conversely, if the successful implementation of the new technology is extremely uncertain and the chances of wrong investment or cannibalization of the organization's existing offerings is high, emphasizing on potential competitive threats can guide the managers towards more calculated decisions.

Although large capability gap generally discourages managers from early investment, our results indicate that capability gap, indirectly through exploration, may influence the timing of investment in an entirely different direction. While exploration approach delays the timing, perception of the capability gap reduces the exploration and, therefore, may result in an earlier investment. Hence, according to the results, by isolating the effects of motivation factors, capability gap can influence the managerial preferences for timing of investment in two opposite ways, and the exploration approach of managers serves as an important link in this equation. Hence, organizations need to be mindful about the spectrum of possibilities for responding to emerging technologies (Dattée et al., 2018) and ensure that the motivational context of the organization does not create biases towards both ends of the spectrum of options. While a focus on bold but unrealistic options can be harmful for the organization due to waste of scarce resources (Alexiev et al., 2010), a myopic response that fails to consider the long-

term effects may endanger the prospect of the organization (Levinthal and March, 1993). Our countervailing indirect and direct effects on timing of investment suggest that when organizations focus on adjusting the motivational contexts, they need to be mindful of the managers' intention underlying the choice of the approach for closing the capability gaps and investment, not just the nature and timing of such decisions. An early investment with an exploratory approach, for example, may be problematic because of lack of consideration of internal and external adjustments that are needed to benefit from such approach. Exploitation, which entails search within the comfort zone and does not involve major deviation from known practices, requires less intensive investment and can be achieved without a need for major coordination and reorganization effort. Exploration, which is the search out of the comfort zone, seems to be a better fit with emerging technologies, providing a better ground for dealing with uncertainties that surround ambiguous and uncertain change. However, this approach requires a delay in investment so that the managers can figure out how far they should search, what major changes they intend to achieve, and how they can approve major deviation from existing known processes and current best practices.

This research makes novel contributions to the literature. It presents an empirically examined and moderated mediation model that explains a number for less understood drivers of managers' strategic decision-making related to timing of investment. Our findings explain how strategic decisions of managers are

influenced by a combination of contextual factors that reflect both ability and motivation, which are important in shaping the decisions. From the perspective of behavioral strategy, this research has illuminated some of the psychological factors that determine the underpinnings of organizations' response to the changes in the environment. Prior research emphasized the role of emotional factors such as envy (Nickerson and Zenger, 2008) as well as emotional commitment and a wide range of other emotional traits of CEOs (Delgado-Garcia and De La Fuente-Sabate, 2010; Hodgkinson and Healey, 2011). Our findings extend this literature by highlighting the role of regulatory focus as motivational reasons, which shape the preferences for following specific strategic tendencies. The empirical analyses suggest that regulatory focus has a key role in determining the strategic preferences of decision-makers, particularly their orientation towards exploratory behavior and timing and intensity of investment. Moreover, it revealed that such effects are salient when the degree of perceived capability gap in the decision-making task intensifies. Moreover, this research adds to the stream of exploration-exploitation literature, which investigates the determinants at the level of individual decision-makers (Mom et al., 2015, Ahmadi et al., 2017) by uncovering some determinants and important consequences of exploration orientation of managers. In a broader context, this research extends the recent discussion about the concurrent effects of motivation and ability on radical technological innovations by organizations (Eggers and Kaul, 2018) by first bringing the discussions on the level of strategic decision makers and second discussing

motivation and ability as an input to the decision and third introducing regulatory focus as a strong motivational factor that determines timing and intensity of investment in emerging technologies.

5 Discussion and conclusion chapter

In this section, I provide summaries of the contributions of each individual study followed by discussion of theoretical and managerial implications of the dissertation. This chapter ends with a discussion on limitations of the thesis as well as ideas for future research.

5.1 Study 1

Study1 attempts to portray exploration orientation in organizations as an outcome of decision-makers' persistent traits and reaction to the cues in the organizational context, and introduced the degree of complexity that an emerging technology imposes as a boundary condition. Prior research suggests that key decision-makers have an important role in reconciling exploration and exploitation (Gibson and Birkinshaw, 2004; Jansen et al., 2008; O'Reilly and Tushman, 2011). By uncovering the overlooked motivational drivers of exploration, we address the calls to go beyond cognition, and attend to other psychological factors in connection with strategic decision-making (see Hodgkinson and Healey, 2011) and develop a psychological perspective on managers' exploration orientation.

Our psychological perspective provides new insights for researchers who use micro-organizational analyses to study exploration and moves beyond recent studies (e.g., Laureiro-Mart et al., 2015, who took a cognitive perspective) to introduce a motivational aspect. Our results show that regulatory focus is a trait that, under certain conditions, has the potential to shape the strategic preferences

of managers. The framework used in Study1 has important implications for understanding how traits and organizational contexts interact to form the preference of decision-makers. We have responded to calls for more research on regulatory fit in organizations (Lanaj et al., 2012; Johnson et al., 2010) by exploring the importance of contextual factors as determinants of managers' preferences. Our results demonstrate how promotion and prevention systems have different effects in different organizational contexts, and interestingly we find that the match between the context and trait to be significant only for the prevention system- – when external cues from the context emphasize prevention by reinforcing the tendency of managers with high levels of prevention focus to avoid exploratory activities which are risky. What is also interesting is that the asymmetric effects of regulatory fit for the promotion and prevention systems which we have found are consistent with Gamache and colleagues' (2015) findings about the effects of the fit between CEO regulatory focus and compensation on acquisition decisions. We extend this line of work by revealing the possibility of underspecified models, and introducing the complexity of the decision-making context as a contingent factor in describing such asymmetric effects in order to provide a more accurate account of regulatory focus theory in studying managerial preferences.

5.2 Study2

Study 2 provides additional theoretical foundations and empirical support for the existence of positive and negative effects of stretch goals, in a field study. Taking

forward the discussions revolving around the paradoxical effects of stretch goals (Sitkin et al., 2011), our results provide evidence that clarifies the effects of stretch goals. Our research moved beyond the prevalent focus of this literature on organizations' overall profit and market share goals and provided a distinct view in terms of the effect of stretch goals on diverse organizational outcomes, not only by examining in depth the determinants of performance inside organizations through a multilevel perspective, but also by including idea generation and opportunity recognition, which have so far been neglected (Gary et al., 2017). This helps research to make a more complete account regarding the efficacy of stretch goals in organizations.

Our results show that stretch goals on average increased the likelihood of participation in an organizational initiative although they were not as effective in increasing the effort of those who were participating. Thus, whether stretch goals can provide a benefit for any given organization depends on (a) the share of employees not truly engaging with the behavior previously and (b) the potential value of the suggestions from these marginal employees. If most employees are already participating, then stretch goals may do as much to encourage negative behavior as positive, making them less useful. And if the specific employees who are not already engaged are unlikely to bring truly useful ideas – potentially because useful ideas stem from employee experience, and most experienced

employees are already involved – then stretch goals may actually create more problems than they solve.

The results provide evidence for the effect of stretch goals on the generation of new business opportunities and show that these effects not only move towards desirable outcomes, but also undesirable ones which is escalating the errors of commission. This research provides insights on recent findings about performance variance that stretch goals bring about (Gary et al., 2017) by explaining for whom they might work and for whom may not. Our finding showed that stretch goals will largely be beneficial for employees who already possess better discernment – based on their previously demonstrated capabilities, their organizational experience, and their level of seniority. The findings of study 2 is in line with the recent research to the extent that the effects of stretch goals "are more complex than previous research indicates, and subject to more caveats and nuances than many practitioner advocates acknowledge" but shows that the recent findings about no effect or negative effects cannot be generalized to all types of performance and contexts.

Moreover, our study complements the prior research of stretch goal that has focused predominantly on a firm and unit level, therefore discussing survival and bankruptcy as potential determinants of the effects of stretch goals (Gary et al., 2017; Sitkin et al., 2011; Sitkin et al., 2017), while the effects of stretch goals are not similar across different levels of analysis. For example, this may be because at unit level, goal adjustment towards survival point and strategy churn might be less

possible or prevalent. Hence, the theories of stretch goals benefit from distinguishing between different levels and organizational settings, and our findings are already one step forward in this direction.

5.3 Study 3

In Study 3, I focused on the capability gap that was imposed by an emerging technology and attempted to explain how decision-makers' perception of the gap and motivational clues in the context, shape her preference for exploration and consequently has implications for the timing of the investment on the emerging technology. Extensive research in strategic management has studied how a firm's knowledge base which includes individuals' knowledge, skills, and abilities as well as the collective capabilities of the firm (Barney, 1991; Kogut and Zander, 1992; Smith, Collins, and Clark, 2005) affects firms' performance. While strategic management scholars have frequently used capability lens and economists the incentive lens, combining capability and motivation together, I believe could bring new insights in studying the managers' behavior.

5.4 Managerial implications

Organizations continuously need to consider their exploratory and exploitative activities at various points of time in order to find a balance and cope with changing business environments. To be able to direct an organization toward the desirable balance, it is worth knowing what factors encourage or hinder preferable behavior. This research offers several recommendations for senior managers who want to affect the exploratory activity of their organizational members and

managers in particular, and especially those dealing with uncertainty of emerging technologies.

First, the effects of possessing a regulatory focus trait suggest that delegating decision-making to managers with a higher level of prevention focus is less likely to lead to favoring exploration. In other words, recruiting and assigning managers with higher prevention focus has the potential to hinder the exploration that might in some cases be needed to ensure the survival and competitiveness of an organization. At a general level, our findings demonstrate that if organizations want to enhance their exploration activities by means of motivation, they need to develop a keen understanding not only of the methods that can be used to trigger decision-makers' choices, but also of their personal traits.

Organizations can empower managers to experiment and delve into unfamiliar areas of knowledge by emphasizing the importance of growth and the value of positive outcomes when decision-making complexity makes it difficult to anticipate the outcomes of a given exploratory behavior. Communicating hopes, aspirations, and desirable positive outcomes to those managers with a strong promotion focus who are dealing with complex problems may accentuate their preference for experimenting with a wide range of options and for seeking unprecedented performance. Consideration of the effects of complexity as a contextual factor is particularly important because there is variation in the level of complexity that decision-makers have to deal with. It is useful for managers who

are faced with different levels of complexity in different projects and tasks concurrently or perhaps those who are moving to a highly complex environment from one which is less complex to attend to the implications of complexity. These managers should be mindful that the same type of organizational contextual factor could trigger different behaviours as the level of complexity changes and a motivational mechanism that works under a particular level of complexity might not work at a different level.

More than selection and hiring, the implications of our study are about training based on both individual traits and contexts. It is important that managers at different levels in the organization are aware of how devising communication systems and incentives that fit the personality of sub- ordinates and the particular context could help in achieving the desired outcome. The elasticity of the systems we have identified opens up new avenues for developing customized training, communication tools and techniques for organizations that will enable them to deal better with different personalities and different contexts.

When it comes to motivating individuals and organizational units to get out of their comfort zones and search for new business opportunities out of their routines, managers can generally benefit from setting seemingly impossible goals, with some considerations.

Stretch goals encourage both participation and engagement, but have a far stronger effect on participation. Stretch goals will largely be beneficial for employees who

already possess the potential to know a good idea from a bad one – based on their previously demonstrated capabilities, their organizational experience, and their level of seniority. A goal can provide a purpose, and guide behavior. However, managers need to consider the costs of unproductive initiatives, taking measures to reduce them when setting stretch goals encouraging specific activities. In fact, it is important to be mindful about effect of stretch goals in escalation of error of commission such as the possible increase in wasteful efforts and initiatives that cost the time and resources, not just for the unit but also for other parties in the organization, who need to discuss and evaluate ideas until it becomes clear that it is not beneficial for the organization to go further with them. In addition to direct cost savings, attending to the quality of ideas during their development and submitting less futile ideas can reduce the negative feelings caused by the process of idea rejection, feelings which may in turn reduce the recognition of future opportunities.

5.5 Limitations and agenda for future research

Despite the insights provided by this research, it has several limitations that correspond to promising areas for future research.

We used experimental vignette methodology following best practice recommendation of Aguinis and Bradley (2014) that encourages the usage of this method in management research. Despite the exclusive benefits of experimental vignette method, utilizing other qualitative and quantitative methods can be

beneficial as well. We believe devising experiments in which business managers react to a real business problem that they could relate to increases the validity of the results. It can portray behavior of managers in business decisions. However, indicating a preference in a simulated business scenario does not completely reflect the actual decision in the exact situation. A field study to evaluate actual reactions and behavior of managers may provide further insights into the key relationships that we studied. In such a setting, it might become feasible to increase the precision of the measurements in the business problem as well, for example, by considering complexity as a continuum rather than two discrete levels.

In this research we focused on the stimulating effect of motivational context. However, we find it important that future research continues to investigate the interaction of individual level traits (e.g. regulatory focus) or perceptions of the managers (e.g. of capability gap) with other contextual factors such as organizational structure, routines, incentives, control systems and so forth.

One step further, we find micro-foundations research that tries to unpack organizations' actions and outcomes into actions and interactions of individuals (Felin et al., 2015), an important direction for future work. Indeed, extending our work to study the effect of psychological concepts and the key decision-makers in different levels on the collective response of the organization is an interesting area of research that requires more attention and other research designs (for example,

the effect of the manager's regulatory focus on the exploratory innovation of organizational unit and the direction of the organization as a whole).

Future research in regulatory focus could look at whether there is any interaction between the two motivation systems. We emphasized that promotion focus and prevention focus can be theorized as independent of one another (Higgins, 1997, 1998; Johnson et al., 2010), and we measured them as continuous variables. It is possible for people to be high on both foci, on just one focus, or on neither focus. Individuals who are low on both foci will generally appear 'amotivated' (Johnson et al., 2015), and motivational systems are not a strong driver of their behaviour. By contrast, individuals who are high on both foci are concerned about future successes and gains as well as possible failures and losses. Because of having different active motivational channels, i.e., eagerness for their promotion focus and vigilance for their prevention focus (Lanaj et al., 2012), individuals who are high on both foci may have both regulatory systems ready and act according to the cues in the context or they may show a combination of approach and avoidance tendencies (Ferris et al., 2011) regardless of the context. It is possible that they employ different strategies at different points of time when confronted with a trade-off between exploration and exploitation – for example by sequential vacillation (Boumgarden et al., 2012) between modes of high levels of exploration and exploration. While our study did not address such possibilities, future studies could consider such theorizing and use research designs that would allow such investigations.

In both experiment studies, in order to focus on the key variables of the study, we did not manipulate variables such as limiting one particular strategic alternative (e.g., the possibility of exploration). Future studies could investigate how individual managers responded to externally imposed constraints as other boundary conditions in similar settings – for example, when the flexibility and possible course of action are restricted by either the organization or the environment.

I acknowledge that the third study requires more work to reach better quality. For example, it only explains the choice of managers for exploration versus exploitation in the face of an emerging technology regarding the predictor variables, namely, the capability gap and situational regulatory focus. However, there are other organizational, environmental and managerial antecedents that are not considered. This highlights the interesting directions for further research, which are to investigate the influence of situational regulatory focus in different contexts, for example by considering leadership style, temporal orientation, and personal traits of managers. Second, despite the value of vignette methods in creating a controlled experimental context, field experimentation can bring better understanding of how managers' inclinations and decisions would be different in real-world situation. Future research can identify companies that have variations in capability gap, prime the decision-makers with promotion or prevention focus, and ask them to address the key strategic dimensions of emerging technologies. A

multilevel survey to measure the capability gap, regulatory focus, managers' exploration orientation, the organization's timing and intensity of investment in emerging technologies and the time-lag can provide further insights into how the complex relationships that have been hypothesized would work in real business setting and through interaction of different levels. The two experiment studies focused on the decision-making process of individual managers. Group decision-making is not considered. It is acknowledged that this could be very influential in the decision-making process (Walsh, 1995). However, the purpose of the studies was to investigate the preferences of individual managers to engage in exploratory activities when faced with a disruptive technology. A promising direction for further research is to investigate collective decision-making and how individuals influence each other (leaders and subordinates) in their preference for exploration or exploitation (Tuncdogan et al., 2015) and subsequently the timing of investment.

Like all studies, the second chapter has important limitations. First, our measurement of stretch goals was survey-based and subjective, in accordance with the previous literature that explains goals cannot be stretched by themselves but can be identified stretch in the context of available resources and capabilities (e.g. Sitkin et al., 2011). Therefore, the extent to which a goal in a unit can be stretched can reasonably be identified by the unit's members who are involved with the goal and who are well informed about both the unit's current resources and capabilities,

and what it takes for that unit to deliver a particular goal, based on some years of experience. At the same time, this doesn't provide a clear indication for managers ex ante on what type of goal will actually be perceived as a stretch goal by employees. To improve this, we encourage more research in organizations via field experiments to test the relationships, where targets in a homogenous group of firms or units can be manipulated, while keeping all other factors intact in a real business setting.

Second, although incentive systems were identical for all the units and individuals within our study, it remains interesting to investigate the type of incentives that influence the desirable outcomes of stretch goals, versus the undesirable outcomes. While we discussed the hierarchical position of the individual, it is still worthwhile to consider the role of organizational structure and control mechanisms at the unit, in harnessing the positive effect of stretch goals. Although both factors were homogenous across the different units of our study, they may vary considerably in a population of firms; therefore, it would be useful incorporate them in future studies, in different contexts.

Third, we also conducted this study in a single large organization, which allows to hold contextual factors constant but which raises questions about generalizability. Individual's motivation to contribute to innovation programs might be contingent on organizational routines, or the organizational culture and how errors are handled within firms in general (Baer and Frese 2003, Keith and Frese 2008). To

capture fully the boundary conditions of stretch goals, further research is warranted about how contextual factors may shape the effects of stretch goals.

In this study, we have focused on whether in the end an identified opportunity has provided a valuable outcome for an organization or not, instead of focusing on the evaluation process. In other words, we have looked at whether stretch goals, in some units, compared to other units, stimulate efforts in identifying opportunities that can eventually generate revenue, whether biases exist in the evaluation process of the organization or not. We believe that the detailed and careful evaluation in this organization based on technical expertise rules out major sources of bias. Moreover, the major bias in the evaluation is the bias towards favoring one's own ideas over the ideas of others (Keum and See, 2017; Reitzig and Sorenson, 2013), while in our setting all ideas were evaluated through a system outside the originating unit. Therefore, the question of whether there might have been some percentage of error in an assessment or not, does not change our results drastically. We encourage research with a holistic view, which can take the details of the evaluation process of submitted opportunities into account in the context of studying stretch goals.

It is also worth saying that goal-setting theory has been developed inductively, through the accumulation of evidence from numerous studies (Latham 2007, Locke 2002, 2007, Locke and Latham 2005). We agree with Locke and Latham (2009), who argue that, despite being rigorously advanced, goal-setting is

an “open-ended theory”, and “there is always more to be discovered” (p. 22), especially when it comes to field studies. Therefore, in parallel to frequently used simulation and lab experiments, which are valuable, we encourage more field work to explain the effects of goals, focusing on different types of performance and different contexts within organizations.

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7 Appendices

7.1 Appendix 2-A Complexity Manipulation- Study A

	Vignette text	
Baseline information	You are a strategic product manager, in charge of a strategic product in a telecom vendor.You are responsible for defining product strategies, plans and road map to secure long term product evolution. One of the key trends in your industry is Cloud computing and for a few years, industry players were speculating how and when Cloud would influence their businesses. Suppose you receive information that a strategic customer that you work closely with has made a number of concrete decisions on how to utilize Cloud opportunities during next 2-4 years. This implies a need to start preparation and responses from your side and potentially consider adaptations in the product that you are in charge of. In a senior-level meeting, you receive more information concerning the intended implementation of Cloud technology in your product. Please continue for the details. Here are the highlights of the meeting and the information you have gathered so far:	
	High-complexity case	Low-complexity case
Manipulations	An agreement has been made with the customer in general terms about implementing Cloud in your product. This case entails many interdependent changes in the architecture and interfaces of your product. Overall, the influences on existing product road map might be significant. Technologies to support this adaptation (e.g. security issues) are not available. There is a high level of uncertainty involved in complementary technologies. You may need to interact with many external parties for your development activities. Current ways of doing business, e.g., pricing model and nature of interactions with customer, may change. There will be a need for	An agreement has been made with the customer about implementing some new features based on Cloud in your product. This case entails some independent changes in the architecture and interfaces of your product. Overall, the influences on existing product road map would not be significant. Technologies to support this adaptation (e.g. security issues) are available. There is not a high level of uncertainty involved in complementary technologies. You may not need to interact with many external parties for your development activities. Current ways of doing business, e.g. pricing model and interactions with

	collaborations with new suppliers. Therefore, predicting the magnitude of business impact will be relatively difficult. The technical and business impacts are highly intertwined and interdependent in such a way that relying on a type of technical solution, the degree of business impact will change, and vice versa.	customer, will not change. There will be no need for collaborations with new suppliers. Therefore, predicting the magnitude of business impact will be relatively easy. The technical and business impacts are not highly intertwined and interdependent.
Final task	You are made responsible by the organization for managing this case, deciding and taking actions when needed. Please note that your organization has agreed to provide required resources.	

7.2 Appendix 2-B Regulatory focus stimuli manipulation-Video Manuscripts

In a meeting, a senior manager explains your organizational situation in this case :

Promotion focus situational cue manipulation

“I think it is a good idea to consider this situation thoroughly. This request brings about lots of opportunities for growth for you as the project responsible. It helps you to exceed your yearly targets which is your main ambition. If you manage to do a good job and show superior performance… you will be associated with a success that contributes to future deals of the organization. You may improve your reputation in driving such strategic projects. You will certainly receive more support and resources from the organization in the future… But if you do not manage to do it, none of these will be achieved”

Prevention focus situational cue manipulation

"I think you have to consider this situation thoroughly. This request brings about lots of obligations and duties for you as the project responsible. You have to do it to avoid falling below your yearly targets which is your main duty. If you don’t manage to do a good job and show poor performance…you will be associated with a failure that will jeopardize future deals of the organization. You may damage your reputation in driving such strategic projects. You will certainly receive less support and resources from the organization in the future… But if you manage to do it, all of these will be avoided.”

7.3 Appendix 2-C Exploratory orientation items

What would be your choices and managerial activities in this situation?

It is more likely that I would...

choose strong renewal and change of the current product architecture and roadmap.	○	○	◉	○	○	○	○	choose incremental and stepwise adaptation of existing product architecture and road map.
search for possibilities to introduce radically new products/services.	○	○	○	○	○	○	○	search for possibilities to improve existing products/services.
approve major deviation from existing best practices and known processes.	○	○	○	○	○	○	○	ensure full compliance with existing best practices and known processes.
exploring only 1 or 2 most promising alternatives (solutions).	○	○	○	○	○	○	○	exploring a wide range of alternatives(solutions).

7.4 **Appendix** 2-D Complexity Manipulation- Study B

	Vignette text	
Baseline information	You are a strategic product manager, in charge of a strategic product in a telecom vendor.You are responsible for defining product strategies, plans and road map to secure long term product evolution. One of the key trends in your industry is Cloud computing and for a few years, industry players were speculating how and when Cloud would influence their businesses. Suppose you receive information that a strategic customer that you work closely with has made a number of concrete decisions on how to utilize Cloud opportunities during next 2-4 years. This implies a need to start preparation and responses from your side and potentially consider adaptations in the product that you are in charge of. In a senior-level meeting, you receive more information concerning the intended implementation of Cloud technology in your product. Please continue for the details. Here are the highlights of the meeting and the information you have gathered so far:	
	High-complexity case	Low-complexity case
Manipulations	An agreement has been made with the customer in general terms about implementing Cloud in your product. This case entails many interdependent changes in the architecture and interfaces of your product. Overall, the influences on existing product road map might be significant. There is a high level of uncertainty involved in complementary technologies. You may need to interact with many external parties for your development activities. Current ways of doing business, e.g., pricing model and nature of interactions with customer, may change. There will be a need for	An agreement has been made with the customer in general terms about implementing Cloud in your product. This case entails some independent changes in the architecture and interfaces of your product. Overall, the influences on existing product road map would not be significant. There is not a high level of uncertainty involved in complementary technologies. You may not need to interact with many external parties for your development

	collaborations with new suppliers. The technical and business impacts are highly intertwined and interdependent in such a way that if you rely for example on one type of technical solution, the elements of business model (e.g. pricing, interactions with customers and reliance on suppliers) will change vice versa.	activities. Current ways of doing business, e.g. pricing model and interactions with customer, will not change. There will be no need for collaborations with new suppliers. The technical and business impacts are not highly intertwined and interdependent. For example, example, by relying on one type of technical solution, the elements of business model (e.g. pricing, interactions with customers and reliance on suppliers) will not change, and vice versa.
Final task	You are made responsible by the organization for managing this case, deciding and tak- ing actions when needed. Please note that your organization has agreed to provide required resources. There are two viable approaches to follow. One approach, for example, includes introducing radically new products and approve major deviation from known processes, and the other includes adapting the products incrementally and ensure compliance with known processes. Note that both approaches are viable but it depends on you to decide about them, when you are asked about it.	

7.5 Appendix 3-A – Examples of new business opportunities

Title	Suggested new business opportunity	Technical details
RPMO REDE Binary Decoder	The service unit combines her knowledge of the customer plans, knowledge of the customer technical capability gaps (lack of post processing solutions), and creatively makes use of the current organization technical capabilities and resources (OSS-RC O14B and internal decoders) to innovate a new feature for a line of products and suggesting new service offerings that could be sold with that.	TelecomA are deploying RPMO into their network. They currently do not have any post-processing solution in place handling RPMO REDE files. A REDE binary decoder does exist and is used internally in the organization but has never been looked at as a published interface. Within O14B line (a set of products) a new feature could be added to make REDE binary decoder available. Vodaones would then be able to create their own post-processing solution based on OSS-RC's REDE binary decoder. PL-OSS plan to publish a REDE binary decoder as new feature in OSS-RC O14B will be licensed and priced separately. In addition to that, installation, test, deployment and maintenance of the REDE decoder can be included in the offering as well.
Adding new MSC-SBC as a passive standby node	The service unit combines her knowledge of the changes in customer side (structure of the transformed networks), and customer needs (traffic recovery after disaster), and the internal technical knowledge creatively to suggests a novel solution for solving the problem by adding a novel functionality to the current product with a few changes.	With the recent Core Network Transformation, customers like BTelecom have all their ISUP connectivity handled by few blade clusters (3 for Rogers). In case of fire or other disasters, if one MSC-S BC goes down, there is no way to recover lost ISUP traffic in short term or even sometimes long term. POI (over ISUP) redundancy has been a hot topic for Rogers ever since their 20 MSCs were transformed into a new core network consisting of just three blade clusters. The magnitude of loss of ISUP connectivity in case on MSC-BC goes down is enormous as compare to older nodes(where if one node went down just a few ISUP routes would have been effected). We did some preliminary work on POI migrations and type of redundancy can be achieved for ISUP routes on the new core network. We have also talked about a possible MDE which is still under QS review. During a steering group meeting, a question was put up by Jim Fielder (one of Rogers Directors), asking on what needs to be done if a long outage is experienced on one of the blade cluster. How can the ISUP routes be rehomed given that a blade cluster controlling them has gone permanently down or is out for long duration (eg. fire)

During brainstorming sessions with the customer one idea that everyone came up with was that why can't we just define all ISUP routes in all the blade cluster. The routes will remain blocked in BCs where they are not primarily controlled. In case of outage with DT changes done on STP and MGW, the routes could be de-blocked on secondary BC. The result of brainstorming was not bad but has a few shortcomings :

1. The BCs should have been configured with this situation in mind beforehand. This means more blades could be required in design.□2. Expected higher traffic would mean that SAEs would have to be adjusted (at least for all ISUP side).□3. If this was done earlier, we could have had identical DT. i.e. device "UPDNAR1-540" for example would mean the same thing in all BCs as it would be connected to the same "RouteX1" going to same destination "DPC yyyy" and using the same CIC. This is not achievable now and would be a nightmare to keep track of it.□So I have this new idea….□The solution is that □1. We use a new MSC-BC with same hardware configuration as existing node i.e. 7+1 blades. Nothing more.□2. Connect this MSC-BC to their IP network, O&M, Billing etc. Everything is tested and verified.□3. In case of permanent failure on say TOUMSC2, customer just loads the TOUMSC2 backup on this new BC□4. Configure the adjacent router with Subnets as required by TOUMSC2.□Everything should come up since same IP as TOUMSC2 is defined on the new BC. This means all associations towards adjacent nodes, MGWs, RAN nodes, STPs will automatically come up and even the ISUP routes handled by TOUMSC2 will come up since from all MGW perspective, the TOUMSC2 is UP and running.□During normal situations, this new BC can have a different dump (as a fourth BC node) loaded. They can even use it for testing and LAB purposes which will benefit us when it comes to doing FOA of new software.

7.6 Appendix 4-A- Regulatory focus context manipulation

Senior managers tell you that the situation of your organization is as follows:

	Promotion focus	Prevention focus
Manipulations	"IoT generates advantages such as digital connectivity and making products and offerings open to everyone, hereby creating potential for growth. We aim to achieve agility in the market through a focus on growth. Your goal is to achieve a better economic situation. We want to reach a better position in the market compared to competitors and increase our market share. If you succeed, you will receive promotion and gain more recognition in the company. If you make the right decisions, many of these benefits will be achieved."	"IoT generates advantages such as digital connectivity and making products and offerings open to everyone, however it might also create potential risks. We aim to mitigate the disadvantages of both higher cost and decreasing sales. Our goal is to avoid economic loss. We do not want to lose our position in the market compared to competitors and see our market share decline. If you fail by making the wrong decisions, you will be held responsible and lose respect from your colleagues. If you make the right decisions many of these risks will be avoided."

7.7 Appendix 4-B- Capability gap manipulation

Vignette text		
Baseline information	Imagine you are a senior manager in an established firm in healthcare industry producing healthcare devices, with a stable positioning vis-á-vis competitors. You are in charge of making decisions about when and how to approach new technologies. One of the key trends in your industry is the introduction of Internet of Things (IoT), a technology that connects people, things and machines, and of course healthcare devices. You know that IoT refers to "the seamless connection of devices and more precisely to an open, comprehensive network of intelligent objects having the ability to organize and share information, data and resources and to react and act in light of situations and changes in the environment".For a few years, industry players have been speculating on how and when exactly IoT would influence their businesses. Suppose your company receives the information that other players already have made certain decisions on how and when to utilize IoT opportunities during the next couple of years. This implies that your company should also start preparing. By the board, you have been appointed to make the final call whether,how, and when to invest in this new technology. In a senior level meeting, you receive more information concerning identified areas where IoT solutions could be beneficial to your company. However, they are not certain yet. Moreover, you receive information on what useful capabilities already exist in your company if your firm wants to invest in IoT. Please note that market position and customer acceptance should not be considered in this case. This is just a general background and you do not need to remember everything on this page. Here are the highlights of the information you receive about the current status of your company related to IoT:	
	Large capability gap	**Small capability gap**
Manipulations	Your company has currently no useable knowledge in sensor technique, data aggregation and analysis which are important to IoT. Your current technological systems are not up to date enough to handle data overload. Related to interoperability, if big changes are required, your technical experts do not have concrete ideas about	Your company has gained considerable knowledge in areas such as sensor technique, data aggregation and analysis which are important to IoT. Your current technological systems are up to date enough to handle some data

	how to make it possible for current systems, products and services. Your company currently does not have useful expertise and skills in data privacy. There are only vague ideas in the company about a new business case that IoT can introduce to the company.	overload. Related to interoperability, if big changes are required, your technical experts have some concrete ideas about how to make it possible for current systems, products and services. Your company has some useful expertise and skills in data privacy. There are some clear ideas in the company about a new business case that IoT can introduce to the company.

8 English Summary

At the intersection of strategic management and applied psychology research, this dissertation focuses on motivation as a main driver of strategic preferences and behaviors in organizations. It explains micro level drivers of managers' preferences in trade-offs related to responding the uncertainties of emerging technologies through a motivation lens, and further combines a capability lens with motivation to investigate the preference of the manager for the delay in investment on an emerging technology. It also explains the exploratory behavior of front-line employees in generating ideas for new business in response to a motivating intervention via stretch goals.

The findings are as following. 1) Manager's orientation toward search, risk-taking, and experimentation is shaped not only by their own motivational systems rooted in their characters, but also by the fit between their motivational systems and the motivational cues in the organization as well as the complexity of the decision-making situation, while there is an asymmetry in response to opposing motivational cues. 2) Stretch goals indeed foster exploratory behaviors to fuel innovation processes in organization, by increasing participation of employees in idea generation for new business opportunities although they may not be as effective in increasing the effort of those employees who have been participating. When it comes to performance outcomes, the difficulty and novelty of stretch goals make individuals less sensitive to the results of their efforts. As such, the paradoxical nature of stretch goals, results in to both intended and unintended performance outcomes. They seem to be more effective for the individuals who are already able to discern the good ideas from the bad based on their experience and seniority. 3) The tradeoffs managers see in early versus late investment in an emerging technology is directly and indirectly affected by their perception of the gap between current capabilities of the firm and what is requires to be successful in the emerging technology. However, it is the motivational cue in the context that interferes with this perception and shapes the final judgements of the managers.

9 Samenvatting (Dutch summary)

Op het snijvlak van strategisch management en toegepast psychologisch onderzoek, richt dit proefschrift zich op motivatie als een belangrijke aanjager van strategische voorkeuren en gedragingen in organisaties. Het verklaart de ’drijfveren van de voorkeuren van managers in afwegingen gerelateerd aan het reageren op de onzekerheden rond opkomende technologieën dankzij motivatieen individuele capaciteiten, om zo de voorkeur van de manager te onderzoeken voor de vertraging in investering op een opkomende technologie. Het verklaart ook het verkennende gedrag van eerstelijnsmedewerkers bij het genereren van ideeën voor nieuwe bedrijven als reactie op een motiverende interventie via stretch goals.

De bevindingen wijzen het volgende uit 1) De houding van de manager ten opzichte van het zoeken naar kennis, het nemen van risico's en experimenten wordt niet alleen gevormd door hun eigen motivaties die hun oorsprong vinden in hun karakter, maar ook door de fit tussen hun motivaties en de motiverende signalen in de organisatie en de complexiteit van de situatie rond besluitvorming, terwijl er een asymmetrie is in reactie op tegengestelde motiverende signalen. 2) Stretch goals bevorderen inderdaad verkennend gedrag om innovatieprocessen in de organisatie aan te wakkeren, door verhoogde deelname van werknemers aan het genereren van ideeën, hoewel ze mogelijk niet zo effectief zijn in het verhogen van de inspanningen van de werknemers die hebben deelgenomen. Als het gaat om de uitkomsten van prestaties, maken de moeilijkheid en nieuwheid van stretch goals individuen minder gevoelig voor de resultaten van hun inspanningen. Als zodanig resulteert de paradoxale aard van stretch goals in zowel bedoelde als onbedoelde resultaten. Ze lijken effectiever te zijn voor de individuen die al in staat zijn om de goede ideeën van de slechte te onderscheiden op basis van hun ervaring en anciënniteit. 3) De afwegingen die managers zien in vroege versus late investeringen in een opkomende technologie worden direct en indirect beïnvloed door hun perceptie van de kloof tussen de huidige mogelijkheden van het bedrijf en wat nodig is om succesvol te zijn in de opkomende technologie. Het is echter het motiverende contextuele signaal die deze perceptie verstoort en de uiteindelijke oordelen van de managers bepaalt.

10 About the Author

Saeedeh Ahmadi (1982 Tehran) received bachelor of industrial engineering from Khaje Nasir university and master of management from Sharif university, Tehran. After a couple of years working in telecom industry, she obtained a master of Data-mining and Statistics from Linkoping university Sweden. She started her PhD in the department of Strategic Management and Entrepreneurship of Rotterdam School of Management, Erasmus University in 2014. As a part of her PhD trajectory, she visited Stern School of Business New, York University in 2017.

Saeedeh's research is at the nexus of strategic management, innovation management, and psychology. Focusing on managerial decision-making in uncertain situations, she tries to understand what makes managers oriented toward riskier options, why some managers get out of comfort zone and why others do not or delay some actions. She is also enthusiastic about assessing the effectiveness of managerial interventions that try to motivate variety seeking and idea generation in organizations.

Saeedeh has presented her research in major international management conferences such as Academy of Management and Strategic Management Society. She has served as ad-hoc reviewer of Journal of management Studies and Psychological Reports.

Saeedeh Currently works as assistant professor of Strategic Management at the Department of International Strategy and Marketing of Amsterdam Business School, University Van Amsterdam.

11 Portfolio

PUBLICATIONS AND WORKS IN PROGRESS	• Published paper o **Ahmadi, S.**, Khanagha, S., Berchicci, L. , Jansen, J.J.P. (2017) Are Managers Motivated To Explore In The Face of a New Technological Change? The Role Of Regulatory Focus, Fit, And Complexity Of Decision-Making, Journal of Management Studies, Volume 54, Issue 2, http://onlinelibrary.wiley.com/doi/10.1111/joms.12257/abstract • Working paper o **Ahmadi, S.** New business opportunities at front end: When stretch goals work? –recipient of Trustfund grant- Under revision in Organization Science • Work in progress o **Ahamdi, S.**, Berchicci, L. Strategizing on new technologies: organizational and managerial determinants of adaptive response- in writing phase- presented in SMS 2016 o **Ahamdi, S.**, Assessing Firm Response To the Cloud Computing Revolution- in the second round of data collection o **Ahmadi, S.**, Breet, S., Glazer, L., Jansen, J. Opportunity recognition by service employees: When setting stretch context backfires – in data analysis phase
CONFERENCE PRESENTATIONS	o **Ahmadi, S.** (2017). New business opportunities at MNE's front end: When stretch goals work? Academy of Management Conference: Atlanta - August 2017 o **Ahmadi, S.**, Jansen, J.J.P. & Khanagha, S. (2016). Fostering dispersed entrepreneurship within large organizations – The role of stretch goals and resource availability ? –Academy of Management Conference: Aanaheim- California- August 2016 o **Ahmadi, S.**, Khanagha, S. (2016). Strategizing on disruptive technologies: organizational and managerial determinants of adaptive response- Strategic Management Society Conference- Berlin- October 2016 o **Ahmadi, S.**, Berchicci, L. & Jansen, J.J.P. (2015). A Motivational Perspective of Exploration: The Effects of Regulatory Focus and Complexity on Exploration –Academy of Management Conference: Vacouver- Canada- August 2015.

	○ **Ahmadi, S.** (2015). Cognitive capabilities, regulatory focus, and **complexity**: The drivers of exploratory behavior in large corporations –Strategic Management Society Conference: St. Gallen- Switzerland- May 2015.
RESEARCH VISIT	• Stern School of Business, New York University Visiting PhD student in department of Management and Organization(2017)- Professor JP Eggers •
TEACHING	• Bachelor level ○ Teaching Fellow in Bachelor Research Training course (2014) ○ Teaching Fellow in Bachelor Internship (2016) ○ Supervisor of 13 bachelor theses (2014) • Master level ○ Teaching Fellow in Master Research Clinic course (2015- 2017) ○ Supervisor of 19 master theses in strategic management and Entrepreneurship (2015-2017) ○ Instructor in research method for management- Quantitative track (2017) ○ Instructor in Managerial decision-making in face of technological change (scheduled for May 2018)
PROFESSIONAL ACTIVITIES AND SERVICES	○ Reviewer for Journal of Management Studies (2017– Present) ○ Reviewer for Psychological reports (2018–Present) ○ Reviewer for Academy of Management conference (BPS ; 2014 – Present)
WORK EXPERIENCE	• Customer Intelligence Internship, T-Mobile NL , 2011-2012 • Marketing Analyst, Taliya 2008-2009 • Strategy Analyst, Taliya (joint of Tele2 Sweden and MCCI Iran),, 2006-2008

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