UNIVERSITY OF LJUBLJANA
FACULTY OF ECONOMICS

JANA KRAPEŽ TROŠT

A MULTI-LEVEL APPROACH IN EXAMINING TEAM INNOVATION

DOCTORAL DISSERTATION

Ljubljana, 2016

AUTHORSHIP STATEMENT

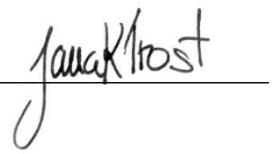
The undersigned Jana Krapež Trošt, a student at the University of Ljubljana, Faculty of Economics, (hereafter: FELU), declare that I am the author of the bachelor thesis / master's thesis / doctoral dissertation entitled A multi-level approach in examining team innovation, written under supervision of Associate Professor Miha Škerlavaj, PhD and co-supervision of Full Professor Aleš Groznik, PhD.

In accordance with the Copyright and Related Rights Act (Official Gazette of the Republic of Slovenia, Nr. 21/1995 with changes and amendments), I allow the text of my doctoral dissertation to be published on the FELU website.

I further declare

- the text of my doctoral dissertation to be based on the results of my own research;
- the text of my doctoral dissertation to be language-edited and technically in adherence with the FELU's Technical Guidelines for Written Works which means that I
    - cited and / or quoted works and opinions of other authors in my doctoral dissertation in accordance with the FELU's Technical Guidelines for Written Works and
    - obtained (and referred to in my doctoral dissertation) all the necessary permits to use the works of other authors which are entirely (in written or graphical form) used in my text;
- to be aware of the fact that plagiarism (in written or graphical form) is a criminal offence and can be prosecuted in accordance with the Criminal Code (Official Gazette of the Republic of Slovenia, Nr. 55/2008 with changes and amendments);
- to be aware of the consequences a proven plagiarism charge based on the submitted doctoral dissertation could have for my status at the FELU in accordance with the relevant FELU Rules on Doctoral Dissertation.

Date of public defence:
Committee Chair:
Supervisor:
Co-supervisor:
Member:

Ljubljana, January/22/2016 Author's signature: 

ACKNOWLEDGEMENTS

To my parents and elder brother who truly inspired in me an appreciation for knowledge and a spirit of intellectual curiosity. To Miha, for mentoring me as your graduate student and supporting me on this long path. To Matej, for your friendship and sound advice. To the members of my dissertation committee: prof. Marko Jaklič, prof. Robert Kaše and prof. Alan Witt for generously offering your time, support, guidance and good will throughout the preparation and review of this thesis. To my amazing husband Nejc, for your constant love, support, encouragement, and never letting me give up.

VEČNIVOJSKI PRISTOP K PREUČEVANJU TIMSKIH INOVACIJ

Povzetek

Glavni namen moje doktorske disertacije je z uporabo večnivojskega pristopa na dveh ravneh raziskovanja (posameznik in skupina) prispevati k poglobljenemu razumevanju področja timskih inovacij. Z namenom prispevati k širšemu raziskovalnemu področju inovativnosti sem svoje raziskovanje gradila na večnivojski teoriji (Kozlowski & Klein, 2000) in se osredotočila na neotipljivo vsebino inovativnosti, njen kontekst in najpomembnejše dejavnike. Ob tem sem še dodatno poudarila vlogo posameznika znotraj skupine.

Obsežen del literature je posvečen ustvarjalni osebnosti, raziskovalci pa so manj pozornosti namenili različnim stilom mišljenja in vedenju ter občutkom članov tima, ki so pomembni za implementacijo ideje na timski ravni in ne zgolj generiranje idej. Zato sem se v prvem poglavju poglobila v literaturo in na podlagi obstoječih ugotovitev poskušala opredeliti katere karakteristike so pomembne za inovativnost na nivoju posameznika in/ali tima. Rezultat dela je bil kvalitativni pregled literature in odkritje ključnih področji raziskovanja znotraj literature o mikro temeljih timske inovativnosti na ravni posameznika in analiza njihovega pomena za timsko inovativnost.

V drugem poglavju sem na podlagi ugotovitev iz prvega poglavja preučevala so-vpliv intuicije in potrebe po spoznanju na uspešnost posameznih faz timskih inovacij. Kot statistično metodo analize podatkov sem uporabila hierarhično multivariacijsko regresijo in preverila rezultate z modelom karakteristik posazmenika in njihovim vplivom na timsko inovativnost. To sem storila na podatkih, zbranih od 249 zaposlenih v štirih podjetjih iz dveh držav: Slovenije in Nemčije. Rezultati so izpostavili in potrdili ugotovitve literature, da sta timska intuicija in potreba po spoznanju pozitivno in statistično značilno povezane s timskimi inovacijami. Poleg tega je moja raziskava pokazala, da obstaja močnejša povezava med intuicijo in timsko generacijo idej na eni strani in potrebo po spoznanju in timsko implementacijo idej na drugi strani. Rezultati in oblika interakcije so pokazali, da je bil najvišji nivo timskih inovacij dosežen, ko so bili zaznani visoki nivoji timske intuicije in potrebe po spoznanju.

V tretjem poglavju sem predstavila in razložila rezultate predhodnih raziskav o razmerju med zaznavami timske intuicije, potrebe po spoznanju in psihološke varnosti v napovedih uspešnosti prve faze timskih inovacij – generacije idej. Regresija na timskem nivoju zahteva uporabo agregiranih rezultatov zato sem agregirala posameznikovo percepcijo timskih intuicij, potrebe po spoznanju in psihološko varnost na timski nivo. Rezultati so potrdili ugotovitve literature, ki trdi da je intuicija pozitivno in statistično značilno povezana z generacijo idej. Hkrati rezultati podpirajo trikratno interakcijo posameznikovih percepcij intuicije, potrebe po spoznanju in psihološke varnosti v razmerju do timskega nivoja generiranja idej. Rezultati in oblika interakcije so pokazali, da so bili najvišji nivoji generanja idej v timih doseženi, ko so bili zaznani visoki nivoji timske intuicije. Poleg tega so timi zaznali visoke nivoje potrebe po spoznanju in psihološke varnosti. Ti rezultati potrjujejo, da delujejo večnivojske sile v procesu generiranja idej.

V četrtem poglavju sem preučevala mikro temelje timske inovativnosti na ravni posameznika. Na osnovi teorije sposobnosti-motivacije-priložnosti sem preučevala medsebojni vpliv proaktivne osebnosti članov tima (sposobnosti), kolektivnega opolnomočenja (motivacija), in podpore vodje (priložnost), ter njihov medsebojni vpliv pri napovedovanju uspešnosti timskih inovacij. Rezultati študije v podjetjih so pokazali, da je kolektivno opolnomočenje pozitivno povezano s timskimi inovacijami. Vendar je bil učinek kolektivnega opolnomočenja na timsko inoviranje šibkejši, ko je tim prejel visoko raven podpore vodje in je proaktivnost moderirala ta odnos. Ko so timi zaznali nižjo raven kolektivnega opolnomočenja, sta bila timska proaktivnost in podpora vodje bolj pomembna za doseganje višjih stopenj timskih inovacij kot so bili, ko so timi zaznali nižjo stopnjo motivacije.

Ključne besede: Timske inovacije, večnivojski pristop, osebnostne lastnosti, organizacijsko obnašanje, temeljna sistema za obdelavo informacij

A MULTI-LEVEL APPROACH IN EXAMINING TEAM INNOVATION

Summary

The main overall research purpose of my dissertation was to contribute to in-depth understanding of the scope of team innovation by using levels approach on two levels of research (individual and team). In order to contribute to the broader field of innovation my research builds on the multi-level theory (Kozlowski & Klein, 2000) and is focused on the intangible content of innovation, its context and the most important factors. At the same time, I further emphasize the role of the individual within the group.

A great deal of literature has focused on creative personality but researchers devoted less attention to different thinking styles and team members behaviors and feelings that are important for team-level idea implementation and not just idea generation. Therefore, in the first chapter of my dissertation I studied the literature and based on the existing findings I tried to identify which characteristics are important for innovation at the individual and / or team level. The result of this work was a qualitative review of the literature and the discovery of key research areas within the literature on the micro-foundations of team innovation on the individual level and the analysis of their influence on team innovation success.

In the second chapter, I explored the interplay among team intuition and need for cognition (NFC) in predicting different phases of team innovation based on the findings from first chapter. As statistical method of data analysis I used a multivariate hierarchical regression and tested the model of individual characteristics and their influence on team innovation success. I did the multi-level study on 249 employees from four European R&D companies from 2 countries: Slovenia and Germany nested within 64 teams. The study revealed that according to the common belief in literature, team intuition and NFC were positively and significantly related to team innovation. Results further support stronger interaction between intuition and team idea generation and NFC and team idea implementation. The forms of interactions demonstrate that the highest levels of team innovation were achieved when perceived levels of team intuition and NFC were high. These findings suggest that multi-level forces operate in team innovation processes.

In the third chapter, I further studied results from first two chapters and focus on the relationship between perception of team intuition, NFC and psychological safety in predicting the first phase of team innovation, the idea generation. The regression at the team level of analysis required the use of aggregated scores, so I aggregated individuals' perception of team intuition, NFC, and psychological safety to team level. The study revealed that according to the common belief in literature (Isaksen, 1987; Scott & Reginald, 1994), intuition is positively and significantly related to idea generation. Results further support the three-way interaction of individuals' perceptions of team-level intuition, NFC and psychological safety in relation to team-level idea generation. The forms of interactions demonstrate that the highest levels of idea generation in teams were achieved when perceived levels of team intuition were high. What is more, teams perceived high levels of NFC and psychological safety. These findings suggest that multi-level forces operate in idea generation processes.

Finally, the fourth chapter is based on ability–motivation–opportunity theoretical framework. The study explores the interplay among team members' proactive personalities (abilities), collective efficacy (motivation), and supportive supervision (opportunity), and their interaction in predicting team innovation. Multi-level study showed that collective efficacy was positively related to team innovation. However, the effect of collective efficacy on team innovation was weaker when high levels of supportive supervision and proactivity moderated this relationship. When teams perceived lower levels of collective efficacy, team proactivity and supportive supervision were more important for achieving higher levels of team innovation as they were when teams perceived lower levels of motivation.

Key words: Team innovation, multi-level approach, personal characteristics, organizational behavior, two parallel systems of personality

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

"Coming together is a beginning. Keeping together is progress. Working together is success." -- Henry Ford

Dissertation research topic and question

Innovation has been highlighted as one of the most important processes since it leads to improved life quality for wider society. The chances of an organization to survive and to be successful and effective in challenging environments are becoming ever more dependent on innovation (Amabile, 1993; Anderson & King, 1991; Baer & Frese, 2003; Bledow, Frese, Anderson, Erez, & Farr, 2009; Choi & Chang, 2009; Prahalad & Krishnan, 2008; Škerlavaj, Song, & Lee, 2010) since it represents the basis of economic behavior (Ancona & Caldwell, 1987; Crossan & Apaydin, 2010; Mansury & Love, 2008; Schumpeter, 1934; Scott & Brouce, 1994).

Schumpeter (1934, p.66) defined economic innovation as the*: "(1) introduction of a new good, that is one with which consumers are not yet familiar or of a new quality of a good; (2) the introduction of a improved or better method of production, which need by no means be founded upon a discovery scientifically new and can also exist in a better way of handling a commodity commercially; (3) the opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before; (4) the conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created; and (5) the carrying out of the better organization of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position*".

Although the innovation importance has been recognized by academics, business and governments, too little attention was devoted to organizational teams and how they can facilitate

or inhibit innovation (e.g., Anderson & West, 1998; Drach-Zahavy & Somech, 2001; Eisenbeiss, van Knippenberg, & Boerner, 2008; Somech & Drach-Zahavy, 2011). Innovation researchers have in recent years been arguing that situational and personal elements contribute to team innovation (Taggar, 2002). Team innovation however, cannot occur without its most important determinant, i.e., creativity (Amabile, 1988). This construct, encompassing the generation of novel and useful ideas, is a necessary though not sufficient antecedent of innovation, which also includes the finalizing step, i.e., an implementation of creative ideas (Amabile, 1988).

Innovation has a socio-political dimension (Maute & Locander, 1994) so for any idea to be implemented and worked up toward an organizational-level innovation, these micro and meso-analytical influences are extremely important (Anderson & King, 1993; Hulsheger, Anderson, & Salgado, 2009; Shalley & Gilson, 2004). As innovative idea moves from its generation through development toward implementation, it is teams who push, modify, or drop the innovation (Shalley, Zhou, & Oldham, 2004; Van de Ven, 1986; West, 2002). Drach-Zahavy and Somech (2001, p.1) defined innovation as *"interactive process among people, structures and processes"*. Hence, to understand how to facilitate team innovation, we should look simultaneously at individual members' personalities and processes and at the team context.

Innovation has become one of the hottest topics in management, searching for the term "innovation" in Google Scholar provides over 3.1 million hits, which proves just how popular it has become. West and Farr (1989, p.16) defined innovation as "*the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society*". Innovation as process is an interactive flow of diverse contributions through different phases.

Team innovation from multi-level perspective

Organizations are made of interacting levels (such as departments, teams, and individuals) with some degree of interdependence that consequently leads to bottom-up and top-down influence

mechanisms (Costa et al., 2013). Multi-level models are statistical models of parameters that vary at more than one level. The multi-level model has become known in the research literature under a variety of names, such as "random coefficient model" (De Leeuw & Kreft, 1986); "variance component model" (Longford, 1987) and "hierarchical linear model" (Raudenbush & Bryk, 1986). The models in my thesis all assume that there is a hierarchical data set, with one single outcome variable that is measured at the team level and explanatory variables at individual and team levels. In this thesis, I will explain the multi-level regression model for two-level data.

Events within teams often reflect the composition of teams, the number and type of individuals who are part of it. As a consequence, extensive research has dealt with team composition (Kozlowski & Bell, 2003). Moreland and Levine (1992) defined team composition along several different dimensions: 1) characteristics of a team and its members: size, demographics, abilities, and personalities; 2) analytical perspective: team composition can be perceived as a result of various social or psychological processes (e.g., socialization), as a context that influences team structure, dynamics, or performance. Team dynamics are the unconscious, psychological forces that influence the direction of a team's behavior and performance. Team dynamics are created by the nature of the team's work, the personalities within the team, their working relationships with other people, and the environment in which the team works (Kozlowski & Bell, 2003).

Between all organizational levels (such as departments, teams, and individuals), there is frequently certain amount of interdependence that creates bottom-up and top-down influences. Organizations, teams, and individuals are connected in a multi-level system. According to Kozlowski and Bell (2003, p.7) *"teams don't behave, individuals do; but they do so in ways that create team level phenomena"*. Individuals are nested within teams, and teams in turn are linked to and nested in organization, a larger multi-level system. This hierarchical nesting, which is characteristic of organizational systems, requires the use of levels approach in order to understand and investigate team phenomena (Kozlowski & Bell, 2003).

The existing research is divided into team and individual levels, each level representing an area of different theories and methods. Academics with a psychological orientation usually focus on micro research whereas researchers with an organizational perspective adopt the macro approach

(Mathieu & Chen, 2011). The meso-level was usually the research field of social psychologists who acknowledged that every phenomenon of interest was influenced by the effects from upper and bottom levels where it exists.

A micro-macro divide is clearly evident in the field of team innovation, where micro research strongly relies on additional disciplines (e.g. psychology). The organizational behavior and psychology literature mostly attempt to contribute to the innovation research by examining creativity, motivation, ability, and opportunity for innovation at individual or team levels (Amabile, 1988; Baer, 2012). Innovation is thus an individual-level phenomenon that may be aggregated to higher levels under suitable conditions.

Rousseau (1985) and Mathieu and Chen (2011) pointed out three essential features in multi-level research that must be united to minimize the level-related errors or mistakes at the incorrect level: the level of theory, the level of measurement, and the level of analysis. Any multi-level research must start with theory. The definitions of innovation at different levels are similar – they all mention the first and last phase – the generation and implementation of new and useful ideas (Amabile, 1983). While, the process of innovation includes different actors, using different elements and outcomes (Van de Ven & Sun, 2011). Consequently, also innovation is not completely isomorphic, i.e. identical or of similar form or structure across levels (Kozlowski & Klein, 2000).

Definitions and actors of team innovation on the other hand are more alike. Pirola-Merlo and Mann (2004) argued that team innovation can be defined as the variety of the quantity and quality of generated in implemented ideas. Team innovation indicates more than just the mediocre innovative performance of members within the team, it also demands that individuals align and manage their individual efforts (Brown & Eisenhardt, 1995).

According to Brown and Eisenhardt (1995) definition of team innovation should be studied as multi-level phenomena. Furthermore, the within-group and between-group variances are also present. It is important to study the relationships and dependencies across both levels of research – individual and team. Now is the perfect timing to study team innovation using a multi-level

approach, because this fairly novel field is developing (Černe, Jaklič, & Škerlavaj, 2013a) but it is still rather new and fast-growing. Additionally, a multi-level approach is necessary if central phenomena of interest are influenced by higher- or lower-levels of organizational units (Kozlowski & Klein, 2000). Team innovation is influenced by lower-levels of organizational units - individuals. Regardless of current attemps to study innovation from a multi-level perspective (Baer & Frese, 2003), not much is known about the way team innovation processes may possibly be affected by innovation processes and outcomes at lower levels of an organizational.

Micro-level foundations of (team)innovation

As noted earlier, innovation has been mostly researched at higher levels (Reiter-Palmon, Herman, & Yammarino, 2008). Nonetheless, some authors defined it as an interactive process among people, structures, and interaction processes (Agrell & Gustafson, 1996; Van Offenbeek & Koopman, 1996; West, 1990b). Innovation cannot occur without creativity, i.e. generation of novel and useful ideas (Amabile, 1988, 1996). Amabile's (1988) model demonstrates the creativity at the individual level. But individual characteristics are not the only defining factor of an individual's creative behaviors as also team factors represent framework for individual perceptions, attitudes, and behaviors, and should be integrated into models of organizational behavior (Kozlowski & Klein, 2000).

Innovations frequently involve changes to an assortment of processes, and are not only the consequence of the action of an individual but for successful implementation of innovation, teamwork and cooperation are necessary (West, Tjosvold, & Smith, 2003). According to Kozlowski and Klein (2000) micro phenomena are set in macro contexts, whereas macro phenomena repeatedly emerge through the interaction and dynamics of lower-level elements.

Thus, constructs such as e.g. supervisory support (Amabile, Conti, Coon, Lazenby, & Herron, 1996) are associated with idea generation improvement. It is crucial to research the relations and interactions across different levels. Without taking into account these relationships researcher

could make methodologically and content-wise incorrect conclusions (Du Toit & Du Toit, 2007). A multi-level approach allows us to explore the context where innovation achieves best results.

Creativity is a necessary, but inadequate antecedent of innovation. In addition, innovation consist also of the finalizing step, the implementation of ideas (Amabile, 1988; Amabile et al., 1996). There is a clear distinction between creativity (invention, generation of ideas) and innovation (the entire process, including implementation) at any level of research. The question of a gap between creativity and innovation also deals with the distinction between the generation and implementation of innovations. This difference is traditionally recognized and considered in the innovation literature. However, this distinction frequently takes place at higher (organizational) levels of research, with individual-level underpinnings overlooked.

Individual innovation is the foundation for group (team) innovation. A substantial body of findings across the research literature has firmly established which factors act as innovation facilitators. Four key factors have been found to be predictive of work role innovation at the individual level-of-analysis: Personality (Barron & Harrington, 1981; George & Zhou, 2001; West & Wallace, 1991), motivation (Amabile, 1983), cognitive ability, (Barron & Harrington, 1981) and mood states (George & Zhou, 2002).

In early studies on innovation scholars assumed that specific personality traits form a member's potential to innovate (Barron & Harrington, 1981). The litertaure has found a connection between aggregate personality of a team member and performance on team level (Moreland & Levine, 1992). Even though team personality composition looks as if to be a fairly robust predictor of team-level performance, literature proposes that different compositions may be more or less successful depending on the job and the amount of individual's interactions necessary for successful team performance (Kozlowski & Bell, 2003).

Idea generation at the individual level provides the foundation for individuals and groups, to pursue innovation. The companies gain a lot from understanding how to reassure innovation from idea generation, as implementation of creative ideas is the final step that provides a tangible value for the company (Baer, 2012). The basis of all innovation is therefore creative idea, and it

is individual members or teams who create, encourage, talk over, change, and eventually implement these ideas (Van de Ven, 1986).

Van Offenbeek and Koopman (1996) claimed that innovation is a continuous process that is made up of the individuals' participation and their interaction. It is a process that builds on knowledge, perspectives and experiences of multiple individuals. Innovation is a multi-act process, in which distinct personalities enter the scene at specific point in time. It's these personalities, each with their unique contributions at the right time that determine innovation success.

Current studies analyze the relationship between personality and innovation in more detail. Personality of an individual plays a fundamental role in defining innovative behavior and it consist of those traits (e.g. temperaments, interests, or needs) that are expected to have a positive effect on the innovative behavior (Rogers & Shoemaker, 1971). Personality refers to an individual's distinctive and stable pattern of thinking, feeling, acting and reacting to his/her social environment (Pervin, 1980). Patterson, Kerrin, and Gatto-Roissard (2009) said that personality takes an important part of the understanding and describing innovative behavior.

Agrell and Gustafson (1996) argue that although innovation starts with individuals and their ideas, it is extremely important that the whole team accepts them otherwise they can be discarded. Employees look to leaders for direction and often imitate their attitudes and behaviors. Therefore, leaders play a crucial role by showing a positive attitude towards new ideas. By providing support and removing obstacles to ensure innovation programs receive the attention, resources, and staff that they need, they increase innovation success. Top management further links innovation to core organizational missions and strategies and leaders can make it a central focus, bringing innovation into the culture and forefront of the organization's activities. Accordingly, individual traits, behaviors, and leaders' influence on team-level innovation need to be studied in detail.

Thus, the main research purpose of my dissertation as a whole is to clarify understanding of micro-foundations as powerful productivity tool for team innovation by using models of

emergence that will hopefully stimulate and guide multi-level research. Attempting to contribute to the broader innovation field, I derive from multi-level theory (Kozlowski & Klein, 2000) and focus on the preferred micro-foundations, and how they can help to create more productive innovation teams and become more effective individuals.

Structure, contents and research questions

The aim of my dissertation research is to investigate the team innovation's micro-foundations at two levels of research: individual and group. I prepare four main chapters as shown in Figure 1. I use a multi-level approach to investigate the antecedents of team innovation at each of the levels, and examine the role they play across levels. Multi-level theoretical models are relevant to the greater part of organizational phenomena (House, Rousseau, & Thomas-Hunt, 1995) and by definition they are planned to bridge micro and macro perspectives, defining relationships between phenomena at both, individual and team level of analysis (Chan, 1998; Kozlowski & Klein, 2000).

My research will contribute to the growing literature on team innovation by cross-level theorizing and empirical investigation of team innovation's micro-foundations. The study is expected to provide further empirical evidences to personality and innovation literature and insights regarding how to foster team innovation behavior in organizations (Yesil & Sozbilir, 2013).

The present study focuses on personality-team innovation relationships, formulates hypotheses and tests them based on the data collected through surveying. This has important implications both for research and practice. Such approach would represent a significant advance as unfortunately, several innovations fail to often because innovators do not recognize the impact individual personalities and behaviors have on team innovation success (Agrell & Gustafson, 1996; Rogers & Shoemaker, 1971). This research will focus on the personality of the innovative person and the goal is to help organizations to find innovative people by analyzing their personality. By focusing on which personalities are related to team innovative behavior,

organizations will be able to find innovative people more easily.

Second overreaching contribution of the thesis is the emergence mechanism in the team innovation context. Emergent phenomena that manifest from psychological characteristics and interactions among individuals are a fundamental dynamic process in multi-level theory. Well-defined models of emergence need to guide the representation of individual-level characteristics at the team level, how the lower-level phenomena manifest at higher levels (Kozlowski & Chao, 2012). The thesis model can support researchers in determining the most appropriate individuals for team innovation success.

In my thesis, I seek to expand the knowledge about the team innovation and I propose that all studied micro-foundations (intuition, need for cognition (NFC), efficacy beliefs, proactivity and psychological safety) can explain team innovation. My research interest lies in the fields of organizational behavior and management. I will draw on assumptions of two theories: Cognitive-experiential self-theory (CEST) (Epstein, 1990) and Ability-Motivation-Opportunity (AMO) model (Appelbaum, Bailey, Berg, & Kalleberg, 2000), which will be used as my overreaching theories and will link my dissertation into a unified whole.

As empirical research regarding personal characteristics and their importance for team innovation is at its early stages, I provide in Chapter 1 a theoretical overview of the antecedents of team innovation that has previously been lacking. This chapter serves as a literature review that deals with the antecedents of team innovation. The first research question in my dissertation is – RQ1: What are the potential antecedents of team innovation? I will answer this question in the form of a systematic literature review.

In Chapter 2 I contribute to the fast-growing field of team innovation and empirically examine the interplay among team intuition and need for cognition (NFC) in predicting different phases of team innovation. The second research question therefor is - RQ2: What is the relation between individuals' perceptions of team intuition, NFC and team innovation? Does team intuition more strongly relates to team idea generation whereas individuals' perceptions of team NFC more strongly relate to team idea implementation?

Chapter 3 goes deeper where first two could not be as specific and studies the interplay among individual perceptions of team intuition, NFC, and psychological safety in predicting the success of first phase of team innovation – idea generation behavior. The third research question is - RQ3: Is the relationship between individuals' perceptions of team intuition and team idea generation moderated by individuals' perceptions of team NFC and psychological safety? Does team intuition more strongly relates to team idea generation at higher levels of perceived team NFC and psychological safety?

Chapter 4 is based on ability–motivation–opportunity (hereinafter AMO) theoretical framework and explores the interplay among team members' proactive personalities (abilities), collective efficacy (motivation), and supportive supervision (opportunity), and their interaction in predicting team innovation. The final research question is RQ4: Is the relationship between individuals' perceptions of collective efficacy and team innovation moderated by individuals' perceptions of team proactive personality and supportive supervision? Does collective efficacy more strongly relates to team innovation at higher levels of perceived team proactive personality and supportive supervision?

AMO model is examining the interplay between personal traits, behaviors and environment whereas the CEST posits that our personalities may be understood as comprising two fundamental information-processing systems, a rational system and an experiential system (Epstein, 1990, 1994, 2003, 2008). Thus the basis for my research will therefore be individual's personality and so I will use a micro-meso level approach. In order to do this I will develop theoretical model that will help me answer the question: What can be done and changed with team innovation concept within the company by hiring the right employees and what can be done by properly managing them.

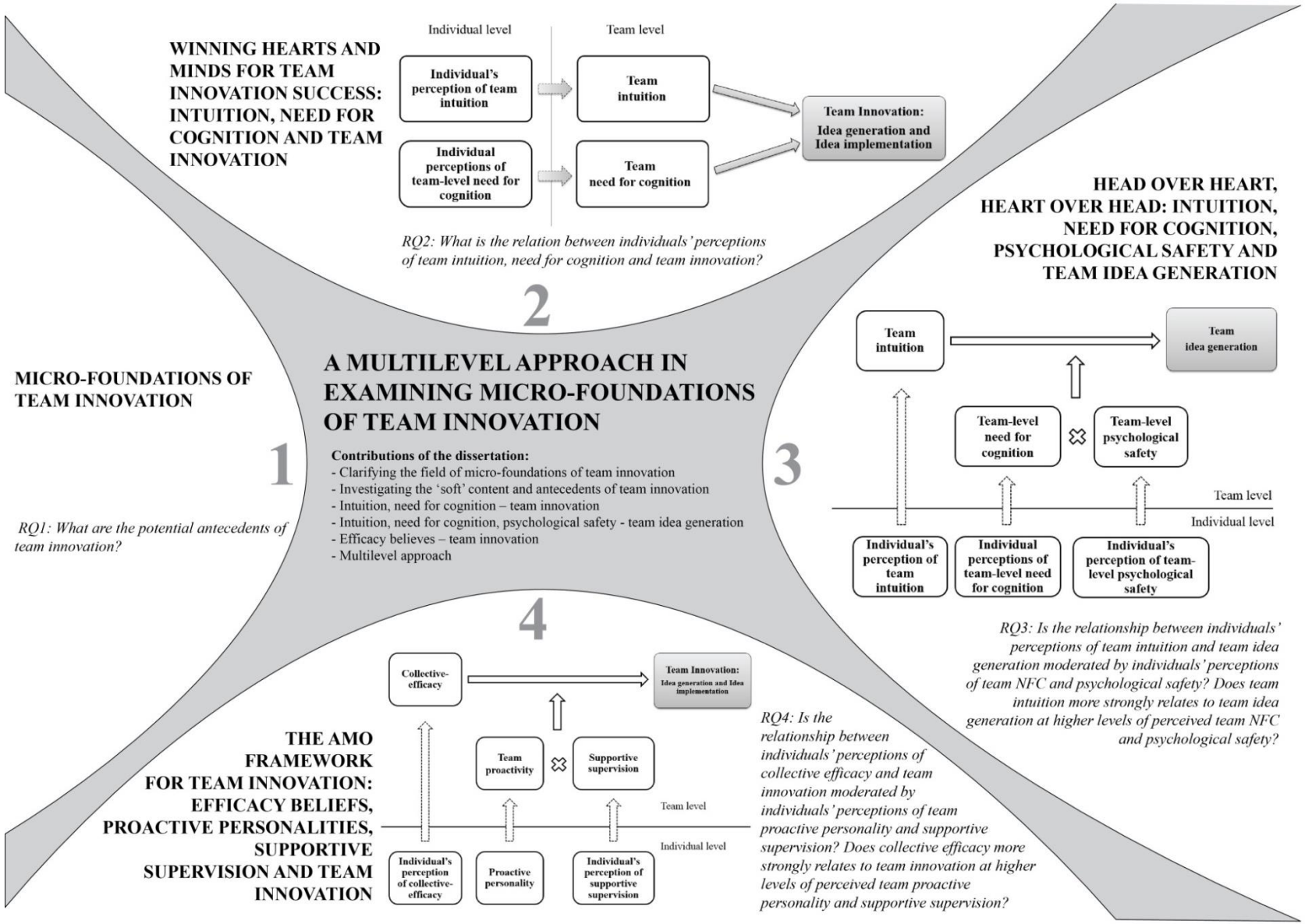
By drawing upon the theoretical perspectives of personal characteristics (Cacioppo & Petty, 1982; Dayan & Di Benedetto, 2011; Edmondson, 1999; Epstein, 1990), team-level emergent states (Marks, Mathieu, & Zaccaro, 2001) and multi-level theory (Chen, Mathieu, & Bliese, 2005; Kozlowski & Klein, 2000), I investigated how individual-level elements (aggregated to team level), as well as their interplay, influence team innovation. I suggest that all individual

constructs (intuition, NFC, efficacy beliefs, proactive personality and psychological safety) will influence team innovation. All studied concepts will be operationalized with pre-published scales that have demonstrated good psychometric properties in earlier research.

With this research, I provide new insights into the individual - team innovation performance relationship, as well as examine the relationship between individual characteristics and its important outcome, team innovation. I contribute to shifting the view in innovation theory that has long presumed that higher levels of innovation are crucial to organizations' performance by providing a piece of empirical evidence that portrays individual characteristics as a key concept within the team innovation performance.

Overall, the following underlying research threads link together my dissertation as a whole: the antecedents of innovation, a multi-level approach to examining and exploring team innovation context.

Figure 1: Dissertation framework



Chapter 1: MICRO-FOUNDATIONS OF TEAM INNOVATION – SYSTEMATIC LITERATURE REVIEW

1.1 From teams and innovation to team innovation

Companies recognize that generating new processes, products and procedures is essential for production and development in all industry sectors. As working under challenging conditions becomes a crucial organizational characteristics (Van Offenbeek & Koopman, 1996), and teams become the unit that manages these changes (Jackson, 1996), studying team innovation processes is essential. The present chapter focuses on micro-foundation of team innovation, examining the previous studies and identifying main antecedents of team innovation processes.

Early innovation research was focused mostly on the organizational innovation and there have not been enough studies on emergent innovation or the establishement of new and enhanced means of team collaboration (Agrell & Gustafson, 1996). However, stronger worldwide competition and innovation have created pressures that are affecting the team's emergence as a basis of every organization. These forces are creating a demand for diverse skills, know how, and experience. Hence, for innovation organizations over and over again depend on teamwork (Ilgen, Hollenbeck, Johnson, & Jundt, 2005), and almost the whole research and development sector give emphasis to teamwork. Kozlowski and Ilgen (2006, p.1) believe that »*Teams of people working together for a common purpose have been a centerpiece of human social organization ever since our ancient ancestors first banded together to hunt, raise families, and defend their communities*«.

Work teams are: *"(a) composed of two or more individuals, (b) who exist to perform organizationally relevant tasks, (c) share one or more common goals, (d) interact socially, (e) exhibit task interdependencies (i.e., workflow, goals, outcomes), (f) maintain and manage boundaries, and (g) are embedded in an organizational context that sets boundaries, constrains the team, and influences exchanges with other units in the broader entity*" (Kozlowski & Bell, 2003, p.6).

Even though this undoubtedly points to the value of an understanding of the factors promoting team innovation, up until last few years there was just a small amount of literature devoted to team innovation (West, 2002). West and Wallace (1991, p. 303) defined team innovation as: "*the intentional introduction and application within a team, of ideas, processes, products or procedures new to the team, designed to significantly benefit the individual, the team, the organization, or wider society*". Their definition points out that innovation is linked to deliberate efforts of team members to achieve the expected goal of the individual, the team, the organization, or the wider society as whole.

Zhuang, Williamson, and Carter (1999) define innovation as: 1) an entirely new invention; 2) an improvement of already existing product; or 3) a distribution of current innovation into a completely new application. Innovation therefore includes two phases: the generation of new ideas and their implementation (Amabile, 1996; Woodman, Sawyer, & Griffin, 1993). Generation of the idea and its implementation are two totally different activities (Baer, 2012; Somech & Drach-Zahavy, 2013) that are associated with specific behaviors, and in case of to great importance of one of these activities, the other activity might face difficulties with s uccessfully carrying it out (Škerlavaj, Černe, & Dysvik, 2014).

First phase is **generation of novel and useful ideas** (Amabile, 1996; Paulus, 2002). In the above definition of innovation, creativity is seen as part of the innovation process, more specifically as part of the idea generation phase. Amabile (1983) suggests that creativity is the process involved in developing the idea for a new product. Osborn (1957) argues that idea generation is a distinct activity from idea evaluation. Morris (1999) further recommends that idea generation is in essence the gathering and incorporation of ideas from numerous resources of recognized knowledge, before actual screening of these ideas. Twiss (1974) proposes that successful innovative companies are market oriented; own a basis of original ideas, and different methods to manage these ideas. In a study made by McAdam and McClelland (2002), it was presented that less but far more productive ideas originate in the research and development division than they do in marketing.

The final phase is selection and implementation of the selected ideas (Amabile, 1988; Scott &

Brouce, 1994). **Idea implementation** is fundamentally imbedded within social contexts (Somech & Drach-Zahavy, 2013) as in order to implement it, workers should exchange, put together, and distribute their ideas. For these practices to be effective, additional knowledge and expertise are required (Mainemelis, 2010). The idea implementation phase requires teamwork and promotion of ideas to other members (Axtell et al., 2000) in order to gather necessary support. Individuals hence require advertising skills that can also be perceived as resources. With such skills they will be able to persuade colleagues that an idea should be realized and consequentially they will be able to change their decisions (Van de Ven, 1986).

As reaction to the emergence of innovation as a critical factor in creating and maintaining competitiveness, a wide range of individual, organizational, and environmental factors have been examined (Hammond, Neff, Farr, Schwall, & Zhao, 2011). Organizations are paying more attention to their employees to produce innovative behaviors as innovations originate from employees ideas (Patterson et al., 2009).

Multi-level research has gained momentum over the past decade, leading to considerable theoretical and statistical improvements. These developments include the conceptualizations and statistical justification of emergent constructs (e.g. Bliese, 2000; Chan, 1998; Chen et al., 2005; Kozlowski & Klein, 2000). Chan (1998) and Kozlowski and Klein (2000) have developed valuable typologies of emergent constructs or compositional models that originate at the level of the individual and are afterwards aggregated up ("emerge") to the team/organizational levels (Table 1 on the following page).

Table 1: The Nature of Aggregate-Level Constructs

Nature of Construct	Chan Type	Internal Consistency	Agreement Necessary	Aggregate Reliability	Examples	Referent(s)	Measurement Strategies
1. Selected score model	NA	Individual	No	NA	Group ability, Group personality	Individual	Individual scale, Archival
2. Summary index model	Additive	Individual	No	NA	Group expertise, Group personality, Work hours	Individual	Individual scale, Archival
3. Consensus model	Direct consensus	Aggregate	Yes	Necessary	Affective tone, Psychological climate, Inter-organizational relationships	Individual	Aggregated individual scale, Delphi method
4. Referent-shift model	Referent-shift consensus	Aggregate	Yes	Necessary	Group climate, Collective efficacy, Team empowerment	Aggregate	Individual scale, Group consensus method
5. Dispersion model	Dispersion	Individual	No	NA	Diversity, Network centrality, Shared mental models	Individual	Individual scale, Archival
6. Aggregate model	NA	Aggregate if applicable	NA	Necessary if applicable	Aggregate size, Aggregate age, Aggregate productivity	Aggregate	Key informants, Archival

Source: Chen, Mathieu, & Bliese 2005; Chan, 1998.

Kozlowski and Klein (2000) explained that composition and compilation emergent processes differ in their underlying conceptual models of emergence. Composition emergent process is based on isomorphism in terms of similarity in construct content across levels (essential are convergence and sharedness among the lower-level entities within the collective). Compilation on the other side is based on discontinuity in terms of difference in the construct structure across levels (essential are variability and configuration among the lower-level entities within the collective). In addition, Morgeson and Hofmann (1999) suggest that emergent constructs (e.g. collective personality) may originate from different sources yet maintain similar meanings and functions to their individual-level counterparts.

According to the Kozlowski and Klein (2000) organizations and teams are bases for development of individual cognitions, attitudes, and behaviors (top-down effects). Top-down effects operate through organizational contexts by influencing groups and individuals, shaping their experiences, perceptions, and behavior. On the contrary, individual cognitions, attitudes, and behaviors can also impact the performance and results of teams and organizations (bottom-up effects).

Leaders have two different roles when dealing with innovation. In a bottom-up role, they encourage innovative outcomes as they facilitate ideas coming from individuals and teams. Leaders are essential in forming the context so that individuals and teams can use their own capacity to produce innovative outcomes. In their second role, a top-down role, leaders embody the organization's innovation strategies and goals. Authors have come to an agreement that organizations should be recognized as multi-level systems therefore, implementing a multi-level perspective is essential to comprehend the real-world occurrences (Kozlowski & Klein, 2000).

I integrate and build on these efforts and frame a basis for conducting construct validation of multi-level concepts. Emergent phenomena that manifest from the bottom-up from the psychological characteristics and interactions among individuals have been largely neglected in quantitative research (quantitative research mostly examines top-down, cross-level relationships). Kozlowski and Klein (2000, p. 55) define multi-level emergence in organizational behavior as: ''*A phenomenon is emergent when it originates in the cognition, affect, behaviors,*

or other characteristics of individuals, is amplified by their interactions, and manifests as a higher-level, collective phenomenon''.

1.2 Systematic literature review

Up till now, only three available meta-analyses on innovation exist, two of them focus on organizational level predictors of innovation (Camison-Zornoza, Lapiedra-Alcami, Segarra-Cipres, & Boronat-Navarro, 2004; Damanpour, 1991), one on team-level (Hulsheger et al., 2009) and one on predictors of individual-level innovation at work (Hammond et al., 2011). In an age characterized by the exponential growth of scientific production, the research reviews are a key link between past and future scientific work and provide a starting point for new research.This review aims to provide clarer view on innovation research field.

I present a brief qualitative literature review of the field that that enables me to get a grasp of the current state of literature that is out there, which serves as a basis for the documents search part. I am to present not only a snapshot of the current state-of-the-art in this field, but also to explore its development over time. With this review I tried to identify the most important contributions and contributiors.

The review comprises of 15 studies, which findings rely on extensive literature reviews and surveys. Studies were published up to 2014, but mostly from 1990 on. In addition to the studies mentioned here, we consulted various studies central to the innovation literature (Anderson et al., 2004; Anderson & King, 1993; Černe, Jaklič, Škerlavaj, Ülgen Aydinlik, & Donmez Polat, 2012; Černe, et al., 2013a, 2013b; Damanpour, 1991; Maier, Streicher, Jonas, & Frey, 2007 Pinchot, 1985; Utterback, 1971) to differentiate specific areas within the broader innovation literature. Key

In Table 2, I summarize some of the common terms, research designs and findings from team innovation literature along with authors that have adopted this view. Key search words were: innovation, team, team innovative performance, innovative behavior, creativity, idea creation, generation, implementation, supervision, creative process, team cohesion, intragroup safety,

team conflict, team tenure, diversity, decision making. Key source of literature were the following journals: Academy of Management Journal, Journal of Management, Journal of Organizational Behavior, Journal of Applied Psychology, Psychological Bulletin, Journal of Management, Administrative Science Quarterly, Academy of Management Review, Organization Science and Journal of Managerial Psychology. However, not any of them examine individual views of team-level innovation. I searched for relevant literature through several online bases (e.g. Web of Science, UH Library, Google Scholar, PubMed, PsycInfo, etc) with the use the keywords mentioned above.

Woodman et al. (1993) showed that individual-, team-, and organizational-level variables interact in promoting innovation. Explicitly, they specified the importance of team's structure and compositional characteristics in facilitating innovative behavior. Additionally, West and Anderson (1996) identified team composition, team diversity, team size, and tenure, as significant antecedents of innovation. *Team composition* not only questions what individual members bring to the team as whole in terms of skill, ability, expertise, etc. but also whether these individual capabilities combined lead to improved performance for the team as a whole. Accordingly, the value of the team success is based on the value of individual team members (Templar, 2011).

The importance of *team members' diversity* for innovation has frequently been discussed (Shalley & Gilson, 2004; West, 2002; Woodman et al., 1993). Studies recommended that team diversity should lead in generation of different standpoints and result in developed and innovative problem solving (Ancona & Caldwell, 1992). With more diversity in the team, the variety of skills, know-how, education, tenure, and viewpoints should positively influence generation of ideas and search for alternatives (McLeod & Lobel, 1992). In addition, (Milliken & Martins, 1996) discussed background diversity as it may lead to barriers in communication, problems in solving conflicting standpoints and reaching agreement within the group as these are important factors for innovation.

Hulsheger et al. (2009) discussed *task and goal interdependence*. Task interdependence discusses the range of team members' dependency on each another to carry out their responsibilities and

perform succesffuly. Goal (also outcome) interdependence, defines the degree to which employees' goals and rewards are linked in such a way that an individual employee can only reach his/her goal if the other members of a team reach their goals as well (Saavedra, Earley, & Van Dyne, 1993; Van der Vegt & Van de Vliert, 2002). Van der Vegt and Van de Vliert (2002) claim that positive relations between task and goal interdependence and innovation can be expected as by working together, employees can exchange ideas, debate different standpoints, and assess them accordingly.

Researchers found different results when studying the effect of *team size* on innovation. Stewart (2006) stressed out that bigger teams might be valuable for innovation. Only teams with several members might be capable of ensuring a comprehensive selection of resources, know-how, abilities, and knowledge to complete demanding jobs. Chen, Farh, Campbell-Bush, Wu, and Wu (2013) pointed out that larger teams usually deal with more complex tasks, which could present a challenge to innovation processes.

West and Anderson (1996) believed that with time teams could possibly turn out to be less innovative as they might become more prone to group-thinking and less motivated to be critical. Further, Katz (1982) claimed that with increasing *tenure teams* have a tendency to become more and more focused on their own team and communicate less with outside experts. However, in order to be innovative, external contacts are necessary as they provide teams with new information and non-routine work designs. Therefore, team longevity could hinder innovation process.

West (1990a) believes that *vision* evaluates the degree to which members of a team have a common understanding of goals and exhibit high commitment to these objectives. If vision is high, team members clearly understand team goals; they value them, and team members feel dedicated to these goals (West & Anderson, 1996). In addition, West (1990a) believes that clear goals can help increase members efforts; give their work meaning, and motivate individuals to improve their innovative performance.

According to Hulsheger et al. (2009) *participative safety* is described by two mechanisms: participation in decision making and intragroup safety. When team members are allowed to take

part and influence decision making, when they and feel free to express their opinion, they will show more dedication and put in more effort in the work (West & Anderson, 1996). Intragroup safety discusses psychologically friendly atmosphere within the group that is described by trust and support. Members of such teams will more likely come up with new ideas as they will not be worried about others' negative judgment (West, 1990a) and such atmosphere is expected to be favorable to innovation process (Amabile et al., 1996). However, Hulsheger et al. (2009) believe that if team members are highly committed to maintaining a nonthreatening atmosphere, they might be afraid of conflict and therefore become wary of criticizing others' ideas. Intragroup safety may consequently get in a way of independent thinking and lead to groupthink.

West (1990a) believes that in a *supportive work environment* unsuccessful attempts to innovate will most probably be tolerated, and consequentially members will more likely to take risk to generate and employ new ideas (Sethi, Smith, & Park, 2001). Hence, innovations will more likely occur in work teams that are perceived as open to change and in those where supervisors and coworkers support new idea generation and implementation (Amabile et al., 1996; Scott & Brouce, 1994).

Teams high on *task orientation* are making every effort to achieve the highest performance standards possible (West, 1990a). Such teams exhibit mutual monitoring, feedback and regular evaluations of ideas. Such behavior will lead to the consideration of contrasting thoughts and in so doing increse the quality of ideas and decisions (Somech, 2006; Tjosvold, Tang, & West, 2004).

Cohesion is one of the most extensively researched team characteristics (Kozlowski & Bell, 2003; Kozlowski & Ilgen, 2006). Lott and Lott (1965) discuss cohesion as commitment of team members to their team and their wish to remain their position of a group member. A strong personal commitment amongst team members forms a psychologically safe working environment in which employees are allowed to search for new ways of working (West & Wallace, 1991). Furthermore, team members who strongly feel they belong and feel committed to other team members are more likely to collaborate and exchange ideas (Hulsheger et al., 2009).

Communication supports the sharing of ideas, which is an important basis for innovation (Keller, 2001). When team members are facing complex problems, consistent, high-quality communication is crucial as it enables members to share their knowledge, experiences, talk over their ideas, which is particularly important for the creation of new ideas (Van de Ven, 1986). However, as communication is crucial also for monitoring and feedback it is vital also for fostering implementation of new ideas (Ancona & Caldwell, 1992; Keller, 2001).

Finally, Pelled (1996) argues that *conflict* may also be beneficial for innovation. However, it is important to distinguish between task and relationship conflict (Jehn, 1995). Task conflict talks about members' disagreements regarding content of the tasks, whereas relationship conflict describes social–emotional conflicts based on interpersonal disagreements (Jehn, 1995). Task conflict is beneficial to innovation as it generates information exchange thorough consideration of opposing viewpoints and promotes the new idea generation and advances problem solving (Shalley & Gilson, 2004). Relationship conflict on the other side can create negative reactions like distress, annoyance, and frustration. Such feelings can sidetrack team members from carrying out their tasks.

Table 2: Summary of the key studies, research designs and findings

Study	Dependent variable	Independent variable	Methodology	Sample	Main findings
Amabile et al. (1996)	Idea creation	Supervisory encouragement	Literature review and critical incidents study	12,525 participants 1925 groups	Supportive work environment is positively related to idea creation.
Ancona and Caldwell (1992)	Innovation	Communication	Survey	409 individuals, 47 new product teams	The greater the communication the higher the ratings of innovation.
Chen et al. (2013)	Team innovative performance	Team size	Survey	482 members of 95 R&D teams	Team size was negatively connected to team innovative performance.
Gilson and Shalley (2004)	Creative process	Vision and shared goals	Interview and survey	144 members of the 11 work teams	The higher the level of shared goals, the more frequently the team will engage in creative processes.
Hulsheger et al. (2009)	Innovation	Cohesion	Literature review	104 independent studies	Cohesion is positively related to innovation.
Hulsheger et al. (2009)		Intragroup safety			Intragroup safety is not positively related to innovation.
Jehn (1995)	Creativity	Task conflict	Survey	633 employees, 104 work groups	Task conflict beneficial for creativity.
Katz (1982)	Performance	Group longevity	Laboratory study	345 individuals, 61 teams	Group longevity can affect performance.

To be continued…

…continued.

McLeod and Lobel (1992)	Performance measurement: number of ideas, number of unique ideas and quality of ideas.	Group diversity	Experiment	137 individuals, 35 teams	Increasing the diversity of team membership. could help teams to increase the creativity of their problem solutions.
Milliken and Martins (1996)	Performance in resolving opposing standpoints and reaching agreement	Background diversity	Literature review	13 leading journals, 34 studies	People who are different from the majority race may experience less positive emotional response and their performance may be evaluated less positively by supervisors.
Pelled (1996)	Performance	Task conflict	Literature review	31 studies	As task conflict increase, group's performance improves.
Scott and Brouce (1994)	Innovative behavior	Supportive work environment	Survey	189 individuals, 26 teams	Supportive organizational climate is positively related to innovative behavior.
Somech (2006)	Innovation	Team reflection	Survey	1,292 members of the 140 primary care teams	Team reflection is positively related to innovation.
Stewart (2006)	Team performance	Team size	Literature review (computer search with PsycINFO and ABI/Inform).	93 studies (697 measures)	Team size is positively related to performance.

To be continued…

…continued.

Van der Vegt and Van de Vliert (2002)	Performance	task and goal interdependence	Literature review	27 studies	Positive relationships between task and goal interdependence and performance.
West and Anderson (1996)	Innovation	Participation in decision making	Survey	243 individuals, 27 teams	Participation predicted innovation outcomes.
West and Anderson (1996)	Innovation	Task orientation	Survey	243 individuals, 27 teams	Task orientation predicted innovation outcomes.
West and Anderson (1996)	Innovation	Team tenure	Survey	243 individuals, 27 teams	Team tenure was unrelated to innovation, except that longer tenure was associated with the effect of innovations on staff well-being.
West and Anderson (1996)	Innovation	Support for innovation	Survey	243 individuals, 27 teams	Support for innovation predicted innovation outcomes.
West and Anderson (1996)	Radical innovation	Team size	Survey	243 individuals, 27 teams	Larger teams instituting more radical innovation.

1.3 Research opportunities in micro-foundations of team innovation

In the last decades, many firms have moved towards team-based structures in order to improve organizational performance. Specifically, the goal of using teams is to ensure realization of the following benefits: improved effectiveness of organizational processes and increased innovativeness through the use of diverse capabilities and viewpoints within a team (Ancona & Caldwell, 1992). Most of the existing research focuses on teams and innovation but a review of the relevant literature revealed that less attention has been devoted to team innovation and almost nothing was done on micro-foundations of team innovation.

This may come as a surprise as several authors have pointed out that individuals are nested within teams, and teams are nested in a larger multi-level system. Therefore, the use of multiple levels -individual, team, and the higher-level context - are necessary to understand team phenomena. Kozlowski and Bell (2001, p.7) said "*teams don't behave, individuals do; but they do so in ways that create team level phenomena*".

Based on the literature above, teams where innovation is especially critical consist of members that cover various areas of expertise and there is a sense of dependency between their work towards the generation and implementation of innovative products and services (Sundstrom, 1999). Brown and Eisenhardt (1995) showed that effective team innovative performance calls for members to innovatively perform their roles within the team, but also that the team as a whole directs individual members' inputs so that the outcome mirrors consisitent innovative whole and not separate parts.

The literature on work teams has suggested that when employees have to synchronize their tasks with the tasks of other team members, team output is not the same to the average output of the member, but is to a certain extent a function of complex team processes (Chen et al., 2013). Therefore, it is vital to study what drives individual members to perform in the team innovatively, as well as what motivates employees collectively to take part in team innovative behavior (Brown & Eisenhardt, 1995).

As proposed by Chen et al. (2013) innovative performance of an individual can emerge to the team level. Chen and Kanfer (2006) argue that after some members of the team exhibit successful innovative behaviors, e.g., recognize creative ideas, are successful in idea implementation, also other team members will probably adopt and in engage innovative behaviors. The opposite is also true, if few members of the team participate in behaviors that undermine innovation, other team members could also adopt such behavior.

Additionally, there is a lack of multilevel research on the factors of team innovation, including micro-foundations. Published work has been primarily focused on one level – e.g. individual innovation based on individual differences (Hulsheger et al., 2009). To extend the understanding of how to encourage team innovativeness, it is vital to use a multi-level approach to examine if the individual differences and contextual effect of supportive leadership impact innovativeness at the team level.

Although we are aware of numerous social and contextual factors that have an effect on existence of innovative behaviors, there is still a great deal that we do not know. As discussed, finding from recent studies have begun to point to which antecedents are more or less favorable to team innovation. Most often, new ideas will typically be presented and pushed toward implementation by individuals and teams. Thus, for any idea generation to be worked up toward successfully implemented innovation, these micro and meso-analytical influences are extremely important (Anderson & King, 1993; Shalley & Gilson, 2004; Shalley et al., 2004). Future studies should therefore continue to examine other micro-foundations and contextual elements of the business environment and their effect on team innovation process. Additionally, more work is needed as how to train and recruit the right employees to achieve team innovation success.

1.4 Theoretical bases for micro-fundations of team innovation

Frymire (2006), p.11) argues that "*the biggest challenge today is not finding or hiring workers, but rather hiring individuals with the brainpower (both natural and trained) and especially the ability to think creatively*". It has become a general recognition that the innovative potential of an organization resides in the skills, expertise and abilities of its employees. This view emerged

already in the early 1990s, where people, not products, are an innovative company's major assets (Van de Ven, 1986).

For researchers interested in understanding how different micro-foundations influence team innovation it is the right time to integrate the extensive literature related to this question. The thesis builds on multi-level model connecting micro and intermediate levels of organization to examine whether personal way of thinking, feeling, behaving, and perceiving have an impact on team innovation. I will use the cognitive-experiential self-theory (CEST) and ability–motivation–opportunity (AMO) framework to improve our understanding of team innovation. The following chapters are based upon the framework and theory that have previously been used to show the effect of individual difference variables on performance.

In second and third chapter, I rely on CEST. Cognitive style is one of the individual variables that affect performance and more specifically, the cognitive processing in decisions. Messick (1976) described cognitive styles as relatively steady attitudes, preferences, or habitual strategies that define individuals' methods of observing, memorizing, thinking, and solving problems. Epstein (1990) posited that according to CEST, people process information by two likely parallel but interacting modes of cognitive styles: analytical-rational style and experiential-intuitive style. In general, the analytical-rational style operates mainly at the conscious level and is deliberate, analytical, logical, and relatively affect-free. In contrast, the experiential-intuitive style is assumed to be automatic, more rapid processing oriented, and associative.

Research connecting decisions to innovation is limited. To start filling this gap, my research empirically explores which of the two processing system (or combination of them) increases idea generation and implementation. Some authors argue that rational decisions may be effective in idea implementation as rational approach permits to proceed in a logical, sequential fashion Sadler-Smith, 1998; Van de Ven, 1986). Other researchers state that idea generation may be improved by intuitive approaches (Dane & Pratt, 2007), or is it the combination, starting with intuitively analyzing the ideas and then rationally implementing them that leads to the highest team innovation success.

In fourth chapter, I rely upon the AMO framework, which suggests that there are three independent work system components that shape employee characteristics and contribute to the success of the teams and organization as whole. The AMO framework is well established in organizational behavior and specifies complementarity among ability, motivation and opportunity in driving behavior (Tuuli, 2012).

The AMO factors are critical to achieve the desired outcome, which is in my research the team innovation. I build on the influence of members' ability, motivation and opportunity on team innovation success. Boxall and Purcell (2003) argue that if company wants to increase innovation it needs to increase employees abilities (skills and knowledge), as they will help them to identify opportunities to innovate. Additionally, according to Boxall and Purcell (2003) employees need to be motivated to expand innovative behavior and direct team efforts towards their goals. Finally, to increase members' innovativeness they should have a clear understanding of the desired outcomes and should be able to openly contribute ideas and suggestions.

Although the research will not analyze all the possible characteristics that might be considered to impact team innovation, it will offer a preliminary investigation into the importance of analyzing the team innovation phenomenon from a multi-level perspective.

Chapter 2: WINNING HEARTS AND MINDS FOR TEAM INNOVATION SUCCESS: INTUITION, NEED FOR COGNITION AND TEAM INNOVATION

In chapter two, I deal with the micro-level foundations of team innovation at the individual level. Every day, individuals are faced with decision whether they should trust their "gut" or rely on rational thought. Their heart tells them one thing, while their mind tries to keep them safe. One decision feels right, while the other is the most logical option. I tried to answer this question with multi-level study on micro-level antecedents of team innovation. This chapter aims to design and test a model examining the antecedents of team innovation. I propose team intuition and need for cognition (NFC) as a crucial predictor of team innovation, including idea generation and implementation phase. I test the model of the antecedents of team innovation using hierarchical regression analysis. Moreover, I test the model on data gathered from 249 employees from four European R&D companies, nested within 64 teams.

The results indicate a crucial role of team intuition and NFC for team innovation, as this link is positively and significantly related to team innovation. In addition, my study provides evidence of stronger interaction between intuition and team idea generation, and NFC and team idea implementation. The forms of interactions demonstrate that the highest levels of team innovation were achieved when perceived levels of team intuition and NFC were high. These findings suggest that multi-level forces operate in team innovation processes. I discuss theoretical and practical implications.

2.1 Introduction

2.1.1 Innovation and team innovation

In today's economy innovation is more than ever the lifeblood of business (Amabile, 1993; Anderson & King, 1991; Bledow et al., 2009). Yet every day companies let this necessity slip away and countless innovative ideas and opportunities are lost. Innovation concerns those processes where individuals, groups, or organizations search for achieving anticipated changes, or escape the consequences of inaction (West, 2002). Innovation is so the introduction of new and improved ways of doing things at work (Anderson & King, 1993). Researchers investigating innovation among teams stress out the significance of the team task and the requests and opportunities it forms for innovation (Paulus, 2002). West (2002) proposes that idea generation takes part mostly in the first phases of the innovation process while the implementation of the idea usually takes place later and therefore these phases should be separated.

Innovation's success relies strongly on the people who are most likely to be present when an innovative idea occurs. However, they are often ignored in this context. How many employees are able to capture innovation when it occurs, or to ensure it has the best possible opportunity to succeed? How many of them have been trained to recognize ideas and use them correctly? Identifying which thinking mode, intuitive or analytical, yields better decisions has been a major subject of inquiry by decision-making researchers (Rusou, Zakay, & Usher, 2013).

There is considerable agreement among researchers that information in decision-making involves two qualitatively different thinking modes but there are different viewpoints regarding the ways in which these two thinking modes interact. Some authors (e.g., Kahneman & Frederick, 2002) have argued that the two modes operate sequentially, yet other researchers (e.g., Damasio, 1994; Epstein, 1994; Glöckner & Betsch, 2008; Sloman, 2002) have suggested that the two thinking modes work in parallel and are used to different extents depending on the decision environment. Identifying the circumstances under which each thinking mode is preferable might help in understanding the advantages of each mode.

In order to fully address these questions and to understand the factors that could facilitate or inhibit team innovation, I outline and test a multi-level model by building upon the Dual Process Theories (DPT). The core assumption of DPT is that reasoning and decision making are accomplished by the joint action of two types of process, differing in terms of the degree to which they are characterized as fast and automatic or slow and conscious (e.g. Kahneman, 2003; Sloman, 2002).

One of the DPT is Cognitive-Experiential Self-Theory (CEST), which was developed as a global theory of personality with two parallel systems (Epstein, 1990). According to CEST information in decision making involves two qualitatively different thinking modes: (1) an intuitive mode characterized by fast and parallel processes that are affective, holistic, and associative in nature and (2) a deliberative/analytical mode characterized by slower processes that are rule based in nature (Epstein, 1994; Kahneman, 2003). As Albert Einstein said: "*The intuitive mind is a sacred gift and the rational mind is a faithful servant"* (Samples, 1976, p.28. The analysis extends understanding of how the thought process in team context can influence engagement in team innovative behavior. Therefore, I propose that it is of an outmost importance to concurrently examine at multi-levels what drives team members to engage in team innovation process.

Rationality is often associated with the "head" and intuition with the "heart"—a common divide in philosophy Dane and Pratt (2007). According to a study made by McCraty, Atkinson, and Bradley (2004) the human heart is playing the main role in the intuitive processing, and they discovered that the heart in fact obtains intuitive information sooner than the brain do– by a second. This specifies independent intellect that can be credited to the heart. Researchers established that the heart has its own forming intelligence network, which allows the heart to act independently, to learn, memorize and feel – all characteristics that, until recently, were believed to be exclusively in the brain's domain.

Cacioppo, Petty, Feinstein, and Jarvis (1996) on the other hand analyzed the empirical relationships of NFC with personality as well as cognitive variables. Their results support the NFC being one of the main mechanisms of cognitive motivation. People high in NFC have high intrinsic motivation to participate and appreciate effortful cognitive activities, they are capable of

remembering more relevant information, to analyze the arguments' quality, they produce several solutions to problems, they are not so confident when assessing the cause-and-effect relationships, they own more know-how, have improved rational cognitive skills and have higher performance in rational tasks when comparing them with individuals that are low in NFC (Cacioppo et al., 1996). Therefore, individuals high in NFC seem to be closer to what is called the "rational human being" than individuals low in NFC.

The primary aim of this study is to propose and test a multi-level model of the relationship between intuition, NFC, and different phases of team innovation. In so doing, I recognize that all three may function at both the individual and the team levels. I aim to contribute to the literature by investigating the influence of individuals' perceptions of team-level intuition and NFC on team innovation.

First and most generally, by building upon the CEST theory and adopting a micro-meso perspective that integrates models of personalities and team innovation, I work toward contributing to the innovation literature by proposing a more comprehensive account of team innovation. Second, an important theoretical contribution of the paper is in applying the CEST, generally investigated and used at the individual level, to the team level. I believe that the model proposed here represents a useful application of this approach to acquiring insights into key aspects of the team innovation process.

Finally, my third contribution is to multi-level theory by incorporating emergent constructs at the individual level to achieve the outcome on team level. Beyond theoretical basis among team innovation models, I posit that the multi-level approach is expected to explain the differences in innovative performance of teams better than would individual- or team-level models alone. Therefore, by adopting a multi-level perspective that incorporates team innovation models, I try to contribute to the existing literature by attaining a fuller understanding of the innovation process as a whole.

2.2 Theoretical background and hypotheses

Despite the prominence of the innovation construct, numerous innovations in practice fail, mainly because innovators do not take into account the importance of the effect individual personalities have on their implementation (Agrell & Gustafson, 1996; Rogers & Shoemaker, 1971). Idea generation is hence a necessary but not sufficient condition for innovation (Baer, 2012). While the recent innovation literature in some ways fills the void between the individual and team level approaches by adopting multi-level principles, it does not focus as much theoretical attention on personal characteristics and their importance in team innovation.

Innovation as an outcome may require a strong sense of intuition and NFC as innovators need to invest a lot of effort over a long period of time without being certain in the outcome. CEST (Pacini & Epstein, 1999) posits that personalities may be understood as comprising two separate, parallel, and interactive fundamental information-processing systems: a preconscious experiential system and a conscious rational system. Isenberg (1984) believed that intuition is not the opposite of rationality; instead, it is based on extensive experience both in analysis, problem solving, and implementation. Intuition may therefore be positioned as being interdependent with rational analysis rather than in opposition to it (Hodgkinson & Sadler-Smith, 2003; Sadler-Smith & Shefy, 2007). "*Intuitive and rational approaches both have their own validity and may be more or less appropriate in different contexts"* (Sinclair & Ashkanasy, 2005, p.359).

Providing a novel perspective, my research posits that it is the constraining factor among these two variables that ultimately determines the outcome. I argue that intuition influences idea generation and NFC idea implementation. I develop two hypotheses in three parts; first discussing reasons that intuition and NFC influence team innovation and then discussing the underlying logic of why perceptions of team intuition may contribute to team idea generation and team NFC may contribute to team idea implementation.

2.2.1 The experiential system

The **experiential system** functions in a way that is preconscious, automatic, fast, effortless, concrete, associative, and minimally demanding of cognitive resources (Epstein, 1990). According to CEST, the experiential system does not only lead behavior in expected way to achieve pleasurable outcomes and to avoid unpleasant ones, but the cognitions themselves are influenced by affect. In line with the development of research, intuition has been conceptualized in several ways that vary widely (e.g., Dayan & Di Benedetto, 2011; Elbanna & Child, 2007; Khatri & Ng, 2000; Mitchell, Friga, & Mitchell, 2005).

I use a broadly accepted theoretical definition of intuition, which is defined in CEST as the "*accumulated tacit information that a person has acquired by automatically learning from experience*" (Epstein, 2008, p.29). Therefore, decisions that are based on intuition are frequently implemented on the basis of unconscious reasoning without analytically comparing strengths and weaknesses of individual options (Dayan & Elbanna, 2011). Leybourne and Sadler-Smith (2006) confirmed that the earlier experience leads to quick decisions, which may incorporate an affective component, such as 'gut feel' or 'hunch'.

Existing research proposes that organizations perceive intuition as a guide when helping managers make fast, accurate decisions (Dane & Pratt, 2007), when important indicators are missing for rational analyses, high uncertainty exists and when decision-makers are facing tasks that are loosely structured (Burke & Miller, 1999; Dane, Rockmann, & Pratt, 2005; Leybourne & Sadler-Smith, 2006). Up until now intuition was mostly defined and researched at the individual level (Akinci & Sadler-Smith, 2012); and less attention has been paid to the team level intuition (Dayan & Di Benedetto, 2011; Eisenhardt, 1999). Salas, Rosen, and DiazGranados (2010) proved that a stronger understanding of how intuition functions at the team level demands multi-level models.

Allison and Hayes (1996) found that people that strongly rely on their intuitive judgment do not worry much about the details but they prefer to interact with people and gather their opinions in order to make intuitive decisions. Furthermore, Dayan and Elbanna (2011) discovered that intuition is often used by new product development teams. Finally, Dayan and Di Benedetto

(2011) provided empirical evidence of the importance of team intuition for team performance. Based on these studies, intuitive decision-makers usually rely on teamwork and take an action-oriented approach.

Team intuition can be beneficial for rapidly solving problems in innovation (Eisenhardt & Tabrizi, 1995; Jett & Brown, 2002). There is a strong reason to believe that development of intuition is not isomorphic at the individual and team level as team intuition involves drawing advice and experience from colleagues and making the individuals' implicit knowledge more available to the team. What is more, daily interactions help team members to develop shared experiences. Hence, due to repeated interactions, team intuition becomes homogenous within the team and members are likely to be a part of the same processes, share experiences, and gather similar information (Hinsz, Tindale, & Vollrath, 1997). I propose that team intuition emerges as a shared referent-shift consensus construct and can be measured using aggregated responses from multiple team members.

According to literature, intuition leads to a wide variety of phenomena, including creativity and innovation (Isaack, 1978; Mitchell et al., 2005; Olson, 1985). Decisions based on intuition are often carried out on the basis of unconscious reasoning without rational evaluation of individual. Several authors have proposed that intuitive problem solving may perform a fundamental role in promoting creative ideas due to its holistic and associative thinking features (Dane, Baer, Pratt, & Oldham, 2011; Dane & Pratt, 2007). During the learning mode individuals will make their own perceptions more important than group perception. However, with time the team as a whole begins to integrate and think intuitively together. Therefore, I propose that individuals' perceptions of team-level intuition can be viewed as a mechanism through which team innovative behavior is influenced.

2.2.2 The rational system

Consistent with CEST, in contrast to the experiential system, the **rational system** is a system that operates according to a person's understanding of the rules of reasoning and of evidence.

The rational system operates primarily at the conscious level, is relatively slow, affect-free, intentional and analytic (Epstein, 1990). Cacioppo and Petty (1982) defined NFC as the tendency to engage in thinking. Individuals high in NFC will more probably organize and assess the information to which they are exposed to, since they want to structure situations in meaningful ways (Cacioppo, Petty, & Kao, 1984; Cacioppo, Petty, Kao, & Rodriguez, 1986; Cacioppo, Petty, & Morris, 1983).

Individuals, who achieve high levels of NFC often engage in situations with high risk that are complex and unusual to them (Cacioppo et al., 1996). As a consequence, they seek new information from their environment (Berlyne, 1960; Evans, Kirby, & Fabrigar, 2003). They are therefore more likely to recognize problems, develop a strong and positive attitude toward them (Dollinger, 2003; Wu, Parker, & de Jong, 2011) and toward achieving their goal (Cacioppo et al., 1986).

NFC is mostly researched at the individual level and less attention has been paid to the team level NFC. There are only a few studies that focus on team member's NFC (e.g., Kearney, Gebert, & Voelpel, 2009). My assumption is that the team NFC can be conceptualized by using summary index model (Chen et al., 2005). In summary index model, the team-level construct is defined as the mean of the individual characteristics and represents an average of the individuals' NFC regardless of the variance among these units.

Also teams can be described as being comparatively high or low in NFC, therefore team NFC has important effect on types of tasks in which the team enjoys engaging (Park, Baker, & Lee, 2008). Team members' tendency to enjoy learning new ways to think and coming up with new solutions to problems may help to make the right decisions regarding innovations. I propose that team-level NFC will be positively associated with team innovative behavior.

Innovations have to do with generation, adoption of useful ideas and their implementation into products and processes (Amabile, 2000; Kanter, 1988; Scott & Brouce, 1994; Van de Ven, 1986; West & Anderson, 1996). The first phase, the generation (initiation) mode, is characterized by creative and intuitive thought, whereas the implementation is characterized by rational and

stabilizing thought (Glynn, 1996; Marcus, 1988; Rogers, 1983; Sadler-Smith, 1998; Van de Ven, 1986). In the generation stage, ideas occur in a non-evaluative context, whereas in implementation stage alternatives need to be evaluated in order to decide with which to proceed (Osborn, 1957; Paulus, 2002). Successful innovation therefore requires not only generation of the idea but also its implementation (Amabile et al., 1996; Baer, 2012; De Drue & West, 2001).

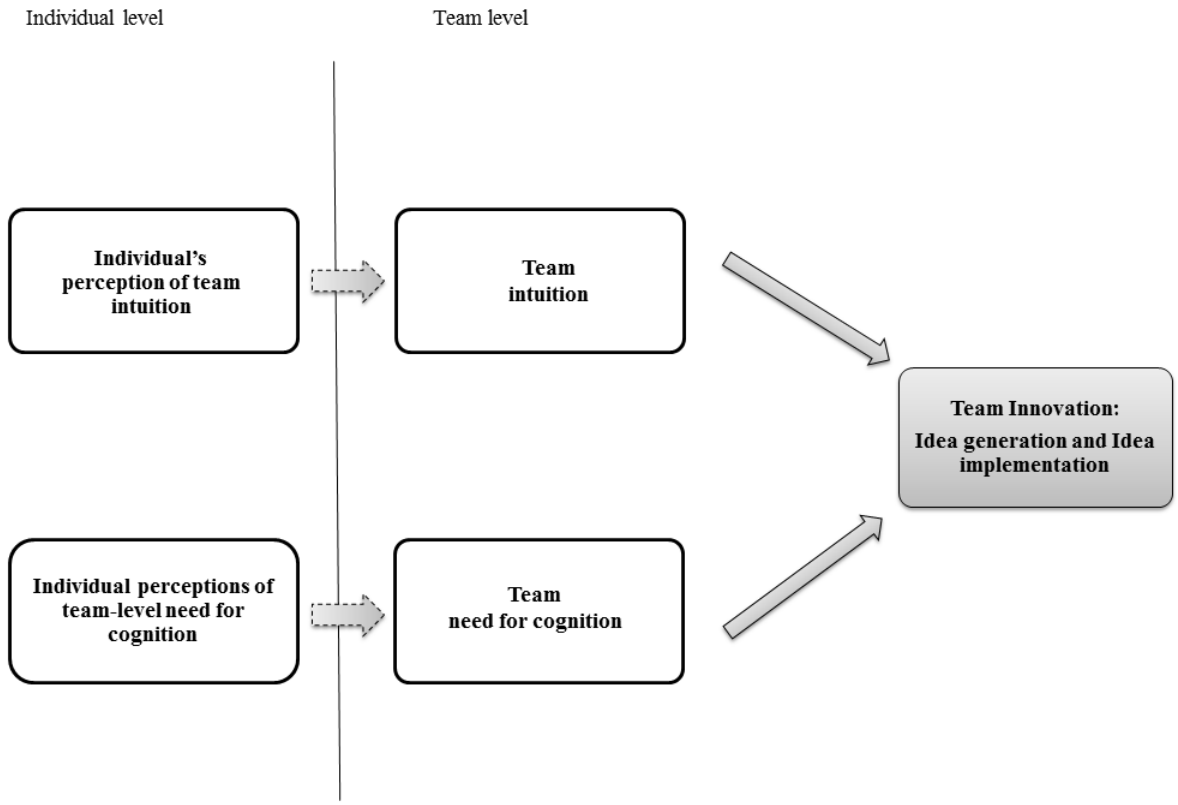
Idea implementation demands its promotion through the accepted channels, testing and integrating innovation into organization (West, 2002). Agrell and Gustafson (1996) claimed that even though the foundation for innovation are individuals and their ideas, it is very important that the team as a whole accepts it or else it can be rejected. Therefore, team members have an essential role in innovation process because of their diverse knowledge, expertise and perspectives (Lovelace, Shapiro, & Weingart, 2001). For any idea to be implemented and worked up toward organizational-level innovation, these micro and meso-analytical influences are extremely important (Anderson & King, 1993; Hulsheger et al., 2009; Shalley & Gilson, 2004; Shalley et al., 2004; West, 2002).

Based on the considerations above, I expect positive relationship between individuals' perceptions of team intuition, team-level NFC and team innovation. Furthermore, the relationship will be stronger between individuals' perceptions of team intuition and team idea generation on one side and team-level NFC and team idea implementation on the other side (see Figure 2). This leads to the following hypotheses:

Hypothesis 1: *There is a positive relationship between individuals' perceptions of team intuition, need for cognition and team innovation.*

Hypothesis 2: *Team intuition more strongly relates to team idea generation whereas individuals' perceptions of team need for cognition more strongly relate to team idea implementation.*

Figure 2: Intuition, need for cognition, and team innovation



2.3 Research method

2.3.1 Sample and procedures

Participants were 249 employees (185 team members and 64 team leaders) working in 64 research and development teams from a German hi-tech electronics company and three Slovenian hi-tech biotechnology, electronics, and IT companies. Studied companies varied by size (from small, medium to large enterprises) with range of employees from 50 to more than 10.700. I surveyed research and development teams among companies from information technology, telecommunication, biotechnology and electronics industries, which allowed us to control for industry-level differences that could influence the success of team innovation. Also, I worked closely with team leaders in all companies to make sure that each surveyed team (a) was

first and foremost responsible for research and development activities, (b) comprised of team members with diverse functions who worked together towards collective goals, and (c) team members worked together for a minimum of two months so that common opinions of their team leader and behavior can emerge. By being such, teams were alike in crucial design features, like membership of the team, tasks' types and interdependence. A comparison of respondents to non-respondents provided no evidence of response bias.

Complete data were obtained from 185 team members (71% response rate) and 64 team leaders (83% response rate) of 77 research and development teams in four companies. The average size of the team (n = 64) in the final sample was 3.28 (range = 2 to 6 members per team). The average company tenure of members was 7.5 years and average age was 35 years; 85% were male, 7.6% had doctoral degrees, 30.8% had master degrees, 40.5% had university degrees, 15.2% had higher education degree, 4.3% had high school degrees and 1.6% had professional middle school degrees. Of team leaders average company tenure was 10.6 years and average age was 40 years; 92.2% were male, 32.8% had doctoral degrees, 21.9% had master degrees, 35.9% had university degrees and 9.4% had higher education degree.

2.3.2 Measures

In order to avoid problems with common method bias, I followed Podsakoff, MacKenzie, Lee, and Podsakoff (2003) suggestions. First, because one of the major causes of common method variance is obtaining measures of predictor and dependent variables from the same rater (Podsakoff, et. al., 2003), data were collected by two separate questionnaires: one for team members and the other for their leaders. Leaders were asked to evaluate team innovation and because the data came from different sources I linked them together with identifying variable (team ID). Secondly, I allowed the respondents' answers to be anonymous (within the team). In addition, I assured respondents that there are no right or wrong answers and that they should answer questions as honestly as possible. These processes should make people less likely to edit their responses in order to be more socially desirable, tolerant, compliant, and consistent with how they think the researcher wants them to respond.

All items used in the study are part of a larger-scale questionnaire; the respondents would therefore likely not have been able to guess the purpose of the study and force their answers to be consistent. Aditionally, nine items in questionnaire were reverse-coded. Additionally, I also made back translation for the questionnaire (Brislin, 1986) in order to prevent losing the meaning of the sentence.

Individual perception of team intuition was measured using seven items adapted by Dayan and Elbanna (2011) measurement scale and was measured using aggregated responses from multiple team members (excluding product/project managers). Responses for this scale were based on a 5-point scale ranging from 1 "not at all" to 5 "to large extent". Items included "*To what extent did participants in this project rely basically on personal judgment*"; and "*Did team members put a lot of faith in their initial feelings about other people and situations"* ($\alpha = .90$).

Individual perception of team-level need for cognition was measured using eighteen items adapted Cacioppo et al. (1996) measurement scale and was measured using an additive composition model (Chan, 1998), in which the team-level construct is the mean of the individual characteristics. Responses for this scale were based on a 5-point scale ranging from 1 "extremely uncharacteristic" to 5 "extremely characteristic". Items included "*I would prefer complex to simple problems*" and reverse coded questions like "*Thinking is not my idea of fun*" ($\alpha =. 93$).

Team innovation: I operationalize team innovation as the combination of the quantity and quality of ideas that are developed and implemented (Eisenbeiss et al., 2008). Team innovation was measured using 22 items from Eisenbeiss et al. (2008) measurement scale. Team leaders had to indicate quantity and quality of ideas developed within the team as well as of ideas implemented. Scales ranged from 1 to 7 but the anchors varied depending on the question. For example, the response for developing ideas, "*My team generates ideas about new targets or objectives*." ranged from 1 "no new ideas generated" to 7 "many new ideas generated". The response for idea implementation, "*How would you assess the quality of implemented ideas according to their novelty*?" ranged from 1 "not at all novel" to 7 "extremely novel" (team idea generation $\alpha = .92$, team idea implementation $\alpha = .93$, team innovation $\alpha = .96$).

Controls: Before describing the methodology I used to test my hypotheses, I wish to emphasize that my intention is not to examine a complete model of team innovation, but rather to examine the role of few potentially important variables - namely intuition and NFC. In testing these hypotheses I acknowledge the role of other variables that may be correlated with different phases of team innovation and need to be controlled for in this study. I controlled for team-aggregated values of member's gender, age, country of residence, level of education, tenure (years in the company).

I controlled for gender, as there is indication (in line with my sample) that there are less women than there are men in technology-oriented firms, which could possibly present further challenges for women in such companies (Eden, 1992). I controlled for age since as Kanfer and Ackerman (2004) showed that motivation vary across one's lifespan. I also controlled for country of residence since I was interested if there are any major differences between employees living in different countries. In addition, employees with higher education are more likely to be capable to generate and implement new innovative ideas. Furthermore, I controlled for team size, since larger teams usually deal with more complex tasks, which could challenge innovation processes (Chen et al., 2013). Finally, employees' organizational tenure will more probably affect their positions toward innovation. More tenured employees may experience stronger psychological commitment to the companies' position and values (Staw & Ross, 1980). Therefore, they may resist the changes (descriptive statistics are presented for all variables in Table 3 on the following page).

Table 3: Descriptive statistics and Inter-item correlation matrix

	Mean	St. dev.	Reliabilities (Cronbach alpha)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Gender	1.85	0.35	n.a.	1										
2. Country	1.43	0.50	n.a.	.23**	1									
3. Age	2.01	0.63	n.a.	0.01	.42**	1								
4. Education	4.17	0.75	n.a.	0.14	.59**	.24**	1							
5. Tenure	3.15	1.06	n.a.	-0.01	.44**	.65**	.18*	1						
6. Team Size	3.28	1.20	n.a.	0.02	.44**	.25**	.15*	.26**	1					
7. Team Intuition	3.28	0.73	0.92	0.01	.35**	0.05	0.13	.21**	.15*	1				
8. Team NFC	3.77	0.72	0.93	0.04	.15*	-0.11	-0.07	-0.09	0.01	.67**	1			
9. Team Innovation	4.25	0.97	0.96	0.04	0.02	-0.11	-0.02	-0.08	0.06	.60**	.65**	1		
10. Team Idea Generation	3.99	1.01	0.92	0.09	0.12	-0.01	-0.01	0.04	.17*	.59**	.57**	.93**	1	
11. Team Idea Implementation	4.51	1.06	0.93	-0.02	-0.09	-.19**	-0.03	-.18*	-0.06	.53**	.64**	.93**	.75**	1

Note: Level-1 n = 185, level-2 n = 64, *correlation is significant at the $p < 0.05$ level, **correlation is significant at the $p < 0.01$ level.

2.4 Results

I tested my hypotheses that predict significant relationships among the variables associated with innovation: intuition and NFC. The correlations among these variables, presented in the Table 1, indicate that the data are consistent with my hypotheses.

I analyzed the data using multivariate hierarchical regression analysis. Since I assumed the demographic variables to be causally prior to all others, I entered them in the first step of multiple hierarchical regression as the control variables: gender, age, country of residence, level of education, tenure and team size and they accounted for 15% of the total variance in team innovation, $F = 7.47$, $p = .61$. However, neither gender ($B = .06$, $SE = .02$, $\beta = .02$, $p = .78$), country of residence ($B = .15$, $SE = .22$, $\beta = .08$, $p = .50$), age ($B = -.20$, $SE = 0.15$, $\beta = -.13$, $p = .19$), level of education ($B = -.05$, $SE = .12$, $\beta = -.04$, $p = .69$), tenure ($B = -.03$, $SE = .09$, $\beta = -.04$, $p = .72$), or team size ($B = .06$, $SE = .07$, $\beta = .07$, $p = .39$) were significantly related to team innovation. The regression at the higher level of analysis required the use of aggregated scores, so I aggregated individuals' perception of intuition to the team level (Mean rwg = .93, SD rwg = .13; ICC[1] = .71, ICC[2] = .87, $F = 7.99$, $p = .000$) and individuals' perceptions of NFC to the team level (Mean rwg = .89, SD rwg = .25; ICC[1] = .64, ICC[2] = .84, $F = 6.12$, $p = .00$) and they all yielded acceptable values. Bliese (2000) claims that when ICC(1) is large (as in my case), a single rating from one individual will likely provide a quite reliable rating of the group mean. High ICC values show that members have a very high level of agreement.

First, I proposed that there is a positive relationship between individuals' perceptions of team intuition, NFC and team innovation. Results indicate positive and statistically significant relationship between three variables (see Table 3). Therefore, hypothesis 1 was confirmed.

My second hypothesis proposes that team intuition more strongly relates to team idea generation whereas individuals' perceptions of team NFC more strongly relate to team idea implementation. I carried out two tests of multiple hierarchical regression, where I first tested team idea generation as dependent variable and secondly I tested team idea implementation. After entering control variables (gender, age, country of residence, level of education, tenure and team size) in

Step 1 of first multiple hierarchical regression (5% of the total variance in team idea generation, $F = 1.56$, $p = .16$.), I aggregated individuals' perception of intuition and NFC in second step of the hierarchical analysis and they accounted for an additional 39.9% of explained variance in team idea generation, leading to a total explained variance of $R^2 = .45$ ($F = 17.94$, $p = .00$). The effects of individuals' perception of intuition and NFC on team idea generation were positive and statistically significant. However, according to results (see Table 4 on the following page) team intuition more strongly relates to team idea generation ($B = .57$, $SE = .12$, $\beta = .41$, $p = .00$) than team NFC does ($B = .47$, $SE = .12$, $\beta = .33$, $p = .00$).

After entering control variables (gender, age, country of residence, level of education, tenure and team size) in Step 1 of second multiple hierarchical regression (4.3% of the total variance in team idea implementation, $F = 1.34$, $p = .24$.), I aggregated individuals' perception of intuition and NFC in second step of the hierarchical analysis and they accounted for an additional 47.8% of explained variance in team idea implementation, leading to a total explained variance of $R^2 = .52$ ($F = 23.96$, $p = .00$). The effects of individuals' perception of intuition and NFC on team idea implementation were positive and statistically significant. However, according to results (see Table 4) team NFC more strongly relates to team idea implementation ($B = .71$, $SE = .11$, $\beta = .48$, $p = .00$) than team intuition does ($B = .47$, $SE = .11$, $\beta = .33$, $p = .00$). Therefore, Hypothesis 2 was confirmed.

Table 4: Results of multivariate hierarchical regression analysis

	Team idea generation is the dependent variable		Team idea implementation is the dependent variable	
	Model 1	**Model 2**	**Model 1**	**Model 2**
1. Gender	.19 (.22)	0.33 (.17)	-.07 (.23)	.06 (.16)
2. Country	.27 (.23)	-0.44* (.19)	.24 (.24)	-.79 (.18)
3. Age	-.16 (.16)	0.06 (.12)	-.24 (.17)	-.01** (.12)
4. EducaItion	-.13 (.13)	0.05 (.10)	.03 (.13)	.27 (.10)
5. Tenure	.03 (.09)	0.02 (.08)	-.09 (.10)	-.09* (.08)
6. Team Size	.12 (.07)	0.16* (.05)	.01 (.07)	.04 (.05)
7. Team Intuition		0.57** (.12)		.47** (.11)
8. Team NFC		0.47** (.12)		.71** (.11)

Note: Level-1 n = 185, level-2 n = 64, values are standardized coefficients, with standard errors in parentheses.

*correlation is significant at the $p < 0.05$ level, **correlation is significant at the $p < 0.01$ level and ***correlation is significant at the $p < 0.001$.

2.5 Discussion

Although the role of personalities (Cacioppo & Petty, 1982; Dayan & Di Benedetto, 2011; Edmondson, 1999; Epstein, 1990) has been discussed in the literature, their interplay and relation to different phases of tem innovation has not been considered. Based on team-level emergent states (Marks et al., 2001) and multi-level theory (Chen et al., 2005; Kozlowski & Klein, 2000), I investigated how individual-level elements (aggregated to team level), as well as their interplay, influence different phases of team innovation. My findings validated my hypothesis that there is positive relationship between individuals' perceptions of team-level intuition, NFC and team innovation.

In line with my second hypothesis, I assesed the influences of rational as opposed to intuitive problem solving on different phases of team innovation. I argue that the relative effectiveness of such methods depends upon an individual's usual thinking style because members will be more innovative when they embrace a problem-solving approach that fits better with a specific phase of team innovation (e.g., members who avoid rational thinking will display more idea generation and individuals who rely on rational thinking will exhibit higher success in idea implementation). In support of my hypothesis, I found that team intuition more strongly relates to team idea generation whereas individuals' perceptions of team NFC more strongly relate to team idea implementation.

2.5.1 Contributions and theoretical implications

Beyond idea generation and implementation, my findings regarding the role of intuition and NFC have implications for team innovative process. I suggest that such approach provides a more comprehensive interpretation of the interplay between the individual and the team in understanding the innovative behavior. The overarching advantage of the multi-level approach over the single-level approach includes the ability to study the interaction of individuals' perception of team-level intuition (experiential system) and NFC (rational system) to achieve higher levels of success in different phases of team innovation.

I contribute to the literature in three ways. First, theoretical and empirical contribution of my study is linked to the investigation of a very important research question: How do individual's experiential and rational system influence different phases of team innovation? My research contributes to the intersection of the literatures on organizational behavior and innovation management by elaborating the importance of the CEST theory at the team-level innovation management, which posits that a team's actions (and not just an individual's) are driven by two elements: experiential (intuition) and rational system (NFC). Additionally, team intuition more strongly relates to team idea generation whereas individuals' perceptions of team NFC more strongly relate to team idea implementation.

My second contribution is to the CEST literature by applying the CEST theory at team level. As CEST theory proposes both systems are necessary for outcome achievement and the results indicate that individual's experiential and rational system influence team innovation. The model represents a useful tool to acquire insights into key aspects of innovation process.

Finally, my third contribution is the use of emergent constructs at the individual level to achieve the outcome on team level. Morgeson and Hofmann (1999) suggested that emergent constructs (e.g. group personality) may originate from different sources but maintain similar meanings to their lower-level constructs. Intuition was aggregated to team level as the referent-shift consensus constructs whereas NFC was aggregated as summary index model and they both showed sufficient inter-member agreement, which justified the aggregation of ratings within units to the unit level (Chen et al., 2005). By detecting relatively high and significant ICC(1) results for these measures further indicate that variability is smaller within teams than between teams.

2.5.2 Practical implications

This study has also an important managerial implication. The study highlights the significance of contributions from both levels (individual and team) when dealing with team-level innovation. Specifically, it suggests that innovation on team level is influenced by team's perceptions and/or

individual personalities. The theoretical model can help inform managers how to successfully employ and train individual team members and teams as a whole in order to achieve higher levels of team innovation. For employees to become better informed and more aware of intuition, organizations should create conditions for employees' intuitive awareness to prosper so that they may make more effective and intelligent use of the intuitions that they experience in their professional and personal lives (Sadler-Smith & Shefy, 2007).

The typical rational manager relies upon "hard" evidence from the past to conduct logical analyses and to make plans and predictions about the future (Sadler-Smith & Shefy, 2004). When the problems are structured, simple, and routine the necessary facts are often available and can be used. Rationality helps employees solve problems based upon knowledge that is explicit. However, research by Dane et al. (2005) indicates that analytical decision making is best suited to highly structured tasks, while intuitive decision making is more effective when decision makers are facing tasks that are poorly structured. Moreover, they may sometimes be required to act quickly and on limited data.

According to the results, both team intuition and NFC are positively related to team innovation. However, team intuition more strongly relates to team idea generation, whereas individuals' perceptions of team NFC more strongly relate to team idea implementation. Hence, organization needs to recruit intuitive and rational employees and provide supportive environment where they have an opportunity to seek continuous improvement and search for innovative solutions. Both, intuition and rationality have limits and each can sometimes lead to bad decisions (Burke & Miller, 1999; Dane & Pratt, 2007; Sinclair & Ashkanasy, 2005). It is more productive to consider intuition and rationality as being at the heart of an important dynamic in team members' cognition (Agor, 1989; Khatri & Ng, 2000; Sadler-Smith & Shefy, 2004) in which both have the potential to balance each other.

2.5.3 Limitations and future research directions

While the above findings make several significant contributions, it is imperative to point out also some of the limitations and debate how they could encourage future research. One of the biggest limitation of my paper are the cross-sectional data since they were collected by studying individuals and teams at the same point in time without regard to differences in and I have non-experimental data therefore, I cannot make casual claims (Antonakis, Bendahan, Jacquart, & Lalive, 2010). Furthermore, although I have empirically tested and cited several studies that support hypotheses in my model throughout the paper, the results should be viewed with caution in light of the smaller sample size. Therefore, feasibility of the model and its ability to complement and extend existing theories should be tested in a large-scale study also in countries outside Europe. In addition, a large part of my sample (87%) represented male team members, so my model should also be tested on a larger sample with higher percentage of female respondent. It is important to now go further, since such research would additionally extend our knowledge about the innovative process.

While I was able to explain that the team- and individual- inputs studied here (i.e. intuition and NFC) have an important impact on different phases of team innovation, I acknowledge that other factors, which I did not take into consideration could also explain team innovative performance. For example, I did not assess other personal characteristics (e.g. efficacy beliefs, proactive personality, psychological safety) and team-level factors that might affect this relationship (e.g. team level leader-members exchange, influence tactics, supportive supervision). Therefore, additional research is needed to build on my model of multi-level teams innovation processes, and take into account further antecedents that encourage innovation across different levels of analysis.

2.6 Conclusion

Despite mentioned limitations, there are important aspects in the present study for researchers as well as practitioners working in the field of innovation. In the study, I applied a multi-level

approach as I wanted take preliminary steps in improving and developing a more comprehensive view of team innovation that comprised emergent influences of individual members on their teams. Intuition and NFC were associated with team innovative behavior. I took this analysis a step further by taking into account how they might relate to individual phases of team innovation. My findings are in line with the idea that intuition and NFC stimulate team innovation. Individuals who rely more on intuition will exhibit higher idea generation whereas individuals who rely more on rational thinking will exhibit higher success in idea implementation. I hope this work will encourage future multi-level studies associated to individual personalities and team innovation.

Chapter 3: HEAD OVER HEART, HEART OVER HEAD: INTUITION, NEED FOR COGNITION, PSYCHOLOGICAL SAFETY AND TEAM IDEA GENERATION BEHAVIOR

In chapter three, I deal with the micro-level foundations of team innovation at the individual level. Based on the findings from first two chapters I tried to answer the question if emotional and rational thinking are to a certain extent mutually exclusive. I order to do this I carried out a multi-level study on 249 employees from four European R&D companies, nested within 64 teams. This chapter aims to unveil the previous contradictory research findings on the relationship between emotional and rational thinking and team innovation by examining the interplay among individual perceptions of team intuition, need for cognition (NFC), and psychological safety in predicting the success of first phase of team innovation – idea generation behavior.

In addition, I contribute to strengthening inferences from Chapter 1 and Chapter 2 by more closely examining the relationship between team intuition and team idea generation. I also investigate the moderating role of individuals' perceptions of team NFC and psychological safety on this relationship. Using the data from four European companies I choose hierarchical regression analysis to explain how these micro level antecedents predict team idea generation. The regression at the team level of analysis required the use of aggregated scores, so I aggregated individuals' perception of team intuition, NFC, and psychological safety to team level.

The results of the study revealed that according to the common belief in literature (Isaksen, 1987; Scott & Brouce, 1994), intuition is positively and significantly related to idea generation. Results further support the three-way interaction of individuals' perceptions of team-level intuition, NFC and psychological safety in relation to team-level idea generation. The forms of interactions demonstrate that the highest levels of idea generation in teams were achieved when perceived levels of team intuition were high. What is more, teams perceived high levels of NFC and psychological safety. These findings suggest that multi-level forces operate in idea generation processes. I discuss theoretical and practical implications.

3.1 Introduction

In recent years the great recession, rapid technological changes, and dynamic environment in general transformed business as I used to know it. Therefore, no organization can survive and prosper without a constant focus on innovation (Amabile, 1993; Anderson & King, 1991; Bledow et al., 2009). West and Farr (1989, p.16) define innovation as "*the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society*".

Innovation process incorporates two stages: the idea generation and their implementation (Amabile, 1996; Hulsheger et al., 2009; West & Farr, 1989; Woodman et al., 1993). The first phase, the generation (initiation) mode, is characterized by creative and intuitive thought and ideas occur in a non-evaluative context, whereas implementation phase is characterized by more rational and stabilizing thought (Glynn, 1996; Marcus, 1988; Rogers, 1983; Sadler-Smith, 1998; Van de Ven, 1986).

With ever more changing environment and complex business processes, organizations restructured work around teams in order to provide faster and more flexible responses to environmental changes (Kozlowski & Ilgen, 2006). Consequently, teams have become the fundamental organizational working unit (Chen et al., 2002) and over 80% of today's work in Fortune 1000 companies is based on a team-work (Hollenbeck, Beersma, & Schouten, 2012).

Therefore, teams are the ones who usually propose new ideas and pursue the ideas toward implementation. For any innovative proposal to be worked up toward an organizational-level innovation, these meso-analytical effects are significantly important (Anderson & King, 1993; Hulsheger et al., 2009; Shalley & Gilson, 2004). Even if the importance of different phases of innovation has been recognized by scholars, businesses and governments, too little attention is being devoted to organizational teams and how they can facilitate or inhibit innovation (Anderson & West, 1998; Eisenbeiss et al., 2008; Somech & Drach-Zahavy, 2011).

Due to advances in multi-level theory, innovation literature has just recently begun to research its initiators across different levels and phases and pointing out the importance of situational and personal elements (Chen et al., 2013; Somech & Drach-Zahavy, 2011; Taggar, 2002). Because team environments foster collaboration and form a desirable basis for generating new ideas, the ability to function effectively as a team member has become vital. Innovation, in turn, depends on the generation of creative ideas by employees (Amabile, 1983; Van de Ven, 1986). Emotional insight is essential to idea generation phase as understanding of emotional needs to exceed the obvious and find truly breakthrough ideas. Thus, rationality is often associated with the "head" and intuition with the "heart"—a common divide in philosophy (Dane & Pratt, 2007).

McCraty et al. (2004) argue that the human heart is playing the main role in the intuitive process. Furthermore, they found in their study that heart actually accepts intuitive information before the brain does (by second or so). Based on their findings I can argue that heart has some kind of independent intelligence and can act independently, absorb knowledge, remember and produce feelings. Such features were up till now believed to be exclusively in the brain's domain (McCraty et al., 2004).

Cacioppo et al. (1996) results showed that NFC can be perceived as one of the main mechanisms of cognitive motivation. Higher NFC is associated with increased appreciation of discussion, idea assessment, and problem solving. People high in NFC possess high intrinsic motivation to engage and enjoy effortful cognitive activities, they are able to recall more applicable task information, to analyze precisely the arguments' quality, they produce several solutions to problems, they are not so confident when assessing the cause-and-effect relationships, they own more know-how, have improved rational cognitive skills and have higher performance in rational tasks when comparing them with individuals that are low in NFC (Cacioppo et al., 1996). Therefore, individuals with NFC seem to be closer to what is called the "rational human being" than individuals low in NFC.

It has been separately shown that intuition influences team innovation (Dayan & Elbanna, 2011; Wu et al., 2011). Team innovation has been defined as "*the intentional introduction and application within a team, of ideas, processes, products or procedures new to the team, designed*

to significantly benefit the individual, the team, the organization, or wider society" (West & Wallace, 1991, p.303). As intuitive decision maker relies mostly on "gut feel", he/she should benefit by the moderating effect of rational thought. The intuition process differs from rational process but decision to rely on intuition is rational.

Furthermore, psychological safety is an important prerequisite, which will foster creativity and idea generation (Da Silvaa & Oldhamb, 2012; Harrington, Block, & Block, 1987). However, I do not yet know the nature of the joint effect of rationality (NFC) and psychological safety in predicting team-level idea generation and how are they related to team intuition.

Although the Cognitive-experiential self-theory (CEST) (Epstein, 1994, 2008; Epstein, Pacini, Denes-Raj, & Heier, 1996), was thus far based largely at the individual-level, it can also be applied to explain team-level outcomes. My understanding of innovation as a broader, multi-level phenomenon therefore needs to address important interactive questions, such as: How do the employees' personalities and perceptions of psychological safety interplay in influencing the first phase of team innovation - idea generation?

In order to better understand the factors that could facilitate or inhibit idea generation in teams I outline and test a multi-level model based upon the CEST theory (Epstein, 1990). CEST is a dual-process model of perception, based around the idea that people process information in two parallel interacting systems: analytical-rational and intuitive-experiential (Epstein, 2003). The relative dominance of the two systems is thought to be influenced by a range of individual and environmental elements.

Behavior, including idea generation, is usually influenced jointly by the two systems and people use both processes interactively, but they are different in regards whether they usually react primarily logically or intuitively to decision situations, or whether they favor following their head or their heart (e.g., Langan-Fox & Shirley, 2003; Witteman, van den Bercken, Claes, & Godoy, 2009). The experiential system in humans adapts by learning from experience. Gathered implicit information that employees obtain by learning from experience can therefore be perceived as intuition (Epstein, 2008).

Despite this diversity of thought in the literature, I use a widely accepted theoretical definition of intuition, which is defined as "*fast and it takes into account nonconsciously generated information, gathered from experience, about the probabilistic structure of the cues and variables relevant to one's judgments, decisions, and behavior*" (Lieberman, 2000, p.110). Analytical - rational system, on the other hand, operates primarily at the conscious level, is analytical and logical (Epstein, 1990). According to Cacioppo and Petty (1982, p. 116) rational system is reflected by NFC, as they define NFC "*as tendency to engage in and enjoy thinking*".

Furthermore, team psychological safety should facilitate intuitive and rational decisions in teams as it improves unnecessary worry about others' reactions to actions that have the ability to embarrass or arepresent a threat, which fast, non-analytical decisions might have. Team psychological safety is defined as the ability and "*a shared belief that the team is safe for interpersonal risk taking*" (Edmondson, 1999, p.354). My analysis extends the understanding of how the team context can stimulate members to engage in the idea-generation process and I generate new knowledge of how members' personalities and perceptions can simultaneously or in combination influence idea generation behavior and consequentially team innovation. Therefore, I propose that it is important to concurrently study at multiple levels what drives team members to engage in idea generation process.

This study aims to contribute to literature in three ways. First, by building upon the CEST theory and adopting a micro-meso perspective that integrates models of personalities, perceptions of psychological safety with idea generation behaviors, I work toward contributing to the innovation literature by proposing a more comprehensive account of team innovation. Second, an important potential theoretical contribution of the paper is in extending the CEST, generally investigated and used at the individual level, to the team level. I believe that the model proposed here represents a useful application of this approach to acquiring insights into key aspects of the idea generation process.

Finally, I intend to contribute also to the multi-level theory by incorporating emergent constructs at the individual level to achieve the outcome at the team level. Beyond theoretical basis among team innovation models, I posit that the multi-level approach is likely to explain differences in

team idea generation process better than would individual- or team-level models alone. Thus, by adopting a multi-level perspective, I seek to contribute towards a more holistic and integrated understanding of the whole innovation process.

3.2 Theoretical background and hypotheses

Morgeson and Hofmann (1999) said that in order to understand how collective structure emerges, one must first comprehend the factors of collective action. Parsons (1951) suggested that the most fundamental unit of analysis is the individual behavioral act. But individual action does not occur in a vacuum, nor is it random (Morgeson & Hofmann, 1999). Individuals' actions will meet resulting in interpersonal interaction.

As interaction take place within bigger groups of individuals (e.g. teams), a structure of shared action emerges that exceeds the individuals who compose the group. Thus, according to Morgeson and Hofmann (1999) the structure of any given group can be seen as a sequence of on-goings, events, and event cycles between the component parts (e.g., individuals). This structure forms the basis for the emergence of collective constructs. In other words, "*the collective action enables collective phenomena to emerge"* (Morgeson & Hofmann, 1999, p.252). Collective structures emerge, are transferred, and continue through the team members' actions. The structures are built from the bottom-up so it is the individuals (or team) who define the group construct, and, through their actions, impact the behavior of other team members (Morgeson & Hofmann, 1999).

Collective construct function can also provide a mechanism for linking constructs across levels. As functions generally remain the same across levels, a functional analysis provides a way to employ the knowledge accumulated about lower-level constructs when formulating theories about collective phenomena (Morgeson & Hofmann, 1999). In such way, the construct actually has the same function at different levels.

3.2.1 Intuition as experiential system of Cognitive-experiential self-theory

Innovative work behavior is based on idea generation (Janssen, 2000; Scott & Brouce, 1994). Idea generation is defined as "*creation of novel and useful ideas*" (Amabile, 1996). This study builds upon CEST (Epstein, 1990), which claims that intuitive and analytical systems operate autonomously. The experiential (intuitive) system functions in a way that is preconscious, automatic, fast, effortless, concrete, associative, and minimally demanding of cognitive resources (Epstein, 1990).

According to CEST (Epstein, 2003), the experiential system does not only lead behavior in an expected way to accomplish satisfyinge outcomes and to sidestep unpleasable ones, but the thoughts themselves are subjective by affect. Decisions based on intuition are often carried out on the base of unintentional thinking without systematically relating strengths and weaknesses of specific options (Dayan & Elbanna, 2011). Intuition is not the product of rational analysis and "conclusion" arises without being preceded by these logical steps. According to Leybourne and Sadler-Smith (2006) the past events lead to rapid decisions that may incorporate an emotional factor, such as 'gut feel' or 'hunch'.

Intuition literature frequently outlines and measures it at the individual level (Akinci & Sadler-Smith, 2012), and not as much of attention has been devoted to the role of team-level intuition (Dayan & Di Benedetto, 2011; Eisenhardt, 1999). There is strong reason to believe that development of intuition is not isomorphic at the individual and team level. Taggart and Valenzi (1990) combined a number of dimensions of the analytical-intuitive term and discovered that individuals, who rely on their hunch when making decisions, are called "person centered".

What is more, they showed that such individuals continuously work together with others in order to make esuccessful intuitive decisions (Taggart & Valenzi, 1990, p.160). Alike, Allison and Hayes (1996) claim intuitive people prefer to interact with others and make intuitive decisions based also on others' opinions and are less concerned with details. What is more, Sadler-Smith and Riding (1999) argued that individuals who rely on intuition have a stronger preference for

working in teams than did analytics. To sum up, these findings shown that intuitive decision-makers take an action-oriented approach and rely on teamwork.

Development of team intuition involves drawing advice and experience from colleagues and making the individuals' tacit knowledge more available to the team. In addition, daily task interactions also help team members to develop shared domain-related experiences. Therefore, team intuition becomes homogenous within the members due to regular contacts and individuals working in the team are likely to be a part of the same process, share experiences, and collect similar information (Hinsz et al., 1997). I propose that team intuition emerges as a shared referent-shift construct (Chan, 1998; Chen et al., 2005) and can be measured using aggregated responses from team members.

Literature suggests that organizations rely on intuition especially when managers need to make fast and accurate decisions (Dane & Pratt, 2007). Such decisions are more often when managers face lack of crucial indicators for rational analyses and when high uncertainty exists (Burke & Miller, 1999; Dane et al., 2005; Leybourne & Sadler-Smith, 2006). Taggart and Valenzi (1990) showed that people, who depend on intuition and their emotional state when making decisions, prefer to work with others to make successful decisions.

Allison and Hayes (1996) claim that people who rely on intuition worry less about the details and they favor to interact with others and make joint intuitive decisions. Similarly, Sadler-Smith and Riding (1999) proved that such individuals have greter preference for working in teams than analytics do. Dayan and Elbanna (2011) found that intuitive decisions are more often used by new product development teams. Finally, Dayan and Di Benedetto (2011) showed empirical evidence of the importance of team intuition for team performance. Based on these studies, intuitive decision-makers usually rely on teamwork and take an action-oriented approach.

It has been assumed that intuition leads to a wide variety of phenomena, including idea generation and innovation (Isaack, 1978; Mitchell et al., 2005; Olson, 1985). According to Kao (1997) and McAdam and McClelland (2002) the idea generation stage requires right-sided (emotional, intuitive) information gathering. Decisions based on intuition are often carried out on

the basis of unconscious reasoning without analytical analysis. Although the experiential system is the default option that determines everyday behavior, people are able to switch to a more analytic, logical mode of thought.

3.2.2 Need for cognition as rational system of Cognitive-experiential self-theory

Unlike the experiential system, the rational system is capable of understanding and correcting for the operation of the experiential system (Epstein, 2003). The rational system can based on conscious effort, decide to accept or reject stimulus from the experiential system. Consequentially, even those who are prone to experiential processing are capable of discounting its influence when they consciously decide to do so (Epstein, 2003).

According to CEST (Epstein, 2003), the rational system operates predominantly at the conscious level, is slower, planned, and analytic (Epstein, 1990). Cacioppo and Petty (1982) argue that NFC mirrors rational system as it characterizes engagement and enjoyment in intellectual activities. Individuals high with NFC are expected to organize and assess the information to which they are exposed to as they have a need to structure situations in meaningful ways (Cacioppo et al., 1984; Cacioppo et al., 1986; Cacioppo et al., 1983).

Individuals that perceive high levels of NFC frequently take part in situations with high uncertainty that are complex and new to them (Cacioppo et al., 1996). Such situations increase interest and people look for new information from their environment (Berlyne, 1960; Evans et al., 2003). Such Individuals are hence more likely to identify problems, develop stronger and more positive attitude toward barriers they face (Dollinger, 2003; Wu et al., 2011). Lastly, they will most probably develop a strong attitude toward achieving their goal (Cacioppo et al., 1986).

Litertaure of NFC mostly defined and measured NFC at individual level and a smaller amount od studies were looking into the role of team-level NFC. Only scarce amount of research exists in which the role of team member's NFC has been emphasized (e.g., Kearney et al., 2009). Allison and Hayes (1996) claim analysts have a preference of focusing on details and hard data that is

available in files and their research revealed that rational decision-makers are mostly self-sufficient. NFC can be conceptualized by using summary index model (Chen et al., 2005) or as Chan (1998) named it additive composition model, in which the team-level construct is defined as the mean of the individual characteristics. The meaning of team NFC is an average of the individuals' NFC regardless of the variance among these units as it has no theoretical or operational concern for composing the individuals' NFC to the team's NFC.

Team members' tendency to enjoy learning new ways to think and coming up with new solutions to problems may help to make the right decisions regarding innovations. Moreover, teams can also be described as being comparatively high or low in NFC, therefore team NFC has important implications for the types of tasks in which the team enjoys engaging (Park et al., 2008). Team NFC can be viewed as a moderating mechanism on the relationship between team intuition and idea generation.

The evidence suggests that individuals with a high NFC are more likely to engage in information seeking activities than are individuals with a low NFC (see Cacioppo et al., 1996, p.239–242). The rational process differs from intuition process but decision to rely on intuition is rational. Indeed, intuition and rational thought can work in a partnership; each system contributes, in its own way, to members' knowledge and decisions. Therefore, as intuitive thinking does not use any rational process, the moderating effect of NFC should lead to more positive relationship between intuition and idea generation. I therefore hypothesize the following:

Hypothesis 1: *The positive relationship between individuals' perceptions of team intuition and team idea generation is positively moderated by individuals' perceptions of team NFC.*

3.2.3 Psychological safety

Accordingly, while team NFC should represent an important condition for individual perceptions of team intuition to predict team idea generation, its impact may depend on the level of team

psychological safety. Studies empirically tested psychological safety as a condition that is likely to foster the emergence of creativity and found general support for the theory and for the importance of psychological safety for creative idea generation (Da Silvaa & Oldhamb, 2012; Harrington et al., 1987).

The meaning of trust in teams has long been discussed by academics (Golembiewski & McConkie, 1975) and the need for employees to trust the members of their team increases due to the pressure to survive in uncertain economic environments (Edmondson, 1999). Team-level psychological safety describes a team climate described by interpersonal trust and shared respect in which they are contented being who they are. The term is meant to suggest a sense of assurance that the team will not humiliate, reject, or discipline someone for expressing heir opinion. This sureness originates from shared respect and trust between members of the team.

Studies have presented that the sense of risk created by debating problems limits employees' readiness to take part in problem-solving activities (Dutton, 1993). Psychological safety is theorized as an emergent property of the group that defines the level of interpersonal safety experienced by members of a specific group (Edmondson, 1999). The results support an integrative perspective in which psychological safety and shared perceptions of intuition and NFC shape team outcomes.

According to Edmondson (1999) team psychological safety needs to describe the whole team rather than individual members of the team, and members have to hold similar perceptions of it in order to be a group-level construct. Team psychological safety develops into homogenous construct due to regular contacts within the team. Team members have a habit of holding similar perceptions about psychological safety — that is, about "the way things are around here" —as they are under the same influences (i.e. have the same leader) and because a lot of of their opinions develop out of joint experiences. I therefore propose that team psychological safety emerges as a shared referent-shift construct (Chan, 1998; Chen et al., 2005).

West (1990b) beliefs that employees working in an organization that provides a supportive environment will more likely propose or implement new ideas than in an environment where

taking risks will lead them being penalized. Therefore, team members' ability to freely debate the risks and possible mistakes or problems they might come across during their work is vital for successful innovation (Edmondson, 1999). In the current study I argue that psychological safety moderates the relationship between intuition, NFC, and team innovation. I propose that companies with stronger perception of team-level psychological safety perform better by contributing to improvement with innovative solutions and ensuring the quality and quantity of ideas generated and implemented than those companies that fail to establish such environment.

Based on the considerations above, I expect a three-way interaction between individuals' perceptions of team intuition, NFC and psychological safety in relation to team idea generation. I propose that individuals' perceptions of team intuition can be viewed as a mechanism through which team idea generation is influenced. If teams are generally high in NFCs and they feel psychologically safe, there should be a positive relationship between intuition and ideas generated.

Furthermore, perceived team psychological safety is expected to have a moderating effect in the influence of intuition on idea generation because teams that feel more psychologically safe think less about the potential negative consequences of expressing new or different ideas than they would otherwise (Edmondson, 1999). Therefore, the higher the perception of psychological safety, the more likely the teams will overcome barriers within idea generation process.

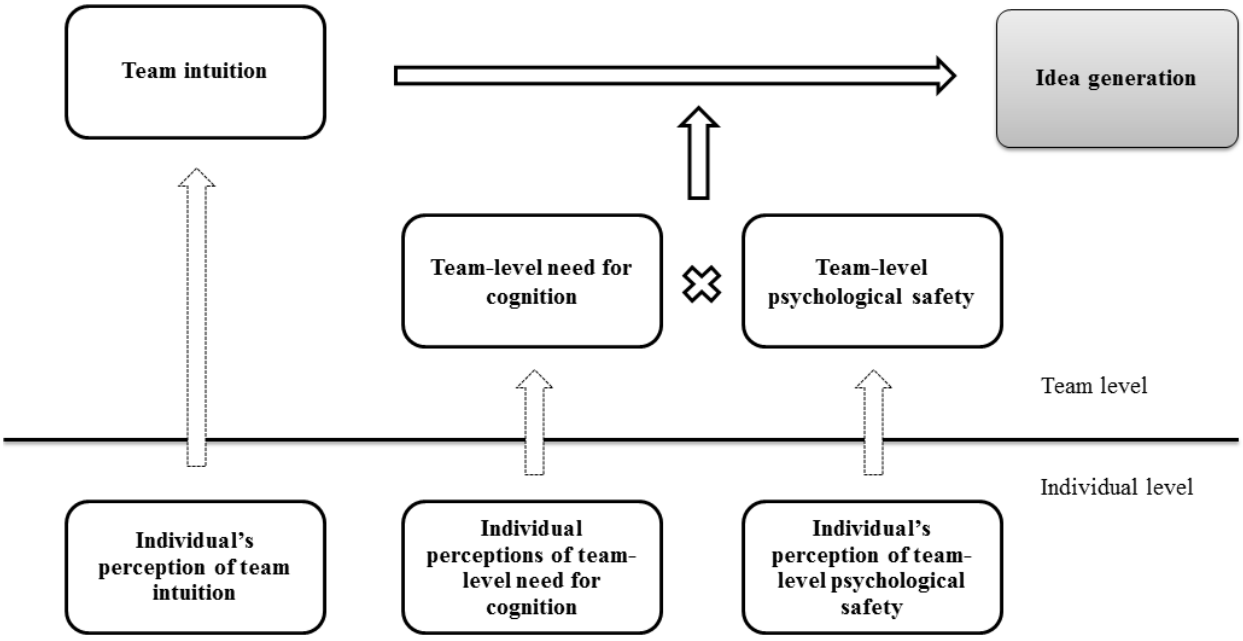
To successfully achieve the desired outcome, team must trust that they are capable to control situation and they perceive high likelihood of success but without the feeling of psychological safety team members will face barriers in achieving their goals. Hence, it is reasonable to expect that intuition will affect team innovation through psychological safety. Furthermore, perceived team psychological safety can, for instance, represent a condition under which the team is not afraid of taking risk, trusts in their intuition and rationally responds to different situations.

Perception of psychological safety decreases job stress that interferes with work performance and provides team members with opportunities that encourage their intuition. This, in turn, should make members reporting high levels of NFC more willing to introduce new thoughts, ideas,

prevent and react to problems, and identify potential opportunities indicated by perceptions of team intuition. On the other hand, if members perceive lower levels of psychological safety, they might feel less secure in their work role, regardless of their intuition and NFC.
I therefore hypothesize the following (see Figure 3):

Hypothesis 2: *The relationship between individuals' perceptions of team intuition and team idea generation is moderated by individuals' perceptions of team NFC and psychological safety. Specifically, team intuition more strongly relates to team idea generation at higher levels of perceived team NFC and psychological safety.*

Figure 3: Intuition, need for cognition, psychological safety and team idea generation



3.3 Research method

3.3.1 Sample and procedures

Participants were 249 employees (185 team members and 64 team leaders) working in 64 research and development teams from a German hi-tech electronics company and three Slovenian hi-tech biotechnology, electronics, and IT companies. Studied companies varied by size (from small, medium to large enterprises) with range of employees from 50 to more than 10.700. I surveyed research and development teams among companies from information technology, telecommunication, biotechnology and electronics industries, which allowed us to control for industry-level differences that could influence the success of team innovation. Also, I worked closely with team leaders in all companies to make sure that each surveyed team (a) was first and foremost responsible for research and development activities, (b) comprised of team members with diverse functions who worked together towards collective goals, and (c) team members worked together for a minimum of two months so that common opinions of their team leader and behavior can emerge. By being such, teams were alike in crucial design features, like membership of the team, tasks' types and interdependence. A comparison of respondents to non-respondents provided no evidence of response bias.

Complete data were obtained from 185 team members (71% response rate) and 64 team leaders (83% response rate) of 77 research and development teams in four companies. The average size of the team (n = 64) in the final sample was 3.28 (range = 2 to 6 members per team). The average company tenure of members was 7.5 years and average age was 35 years; 85% were male, 7.6% had doctoral degrees, 30.8% had master degrees, 40.5% had university degrees, 15.2% had higher education degree, 4.3% had high school degrees and 1.6% had professional middle school degrees. Of team leaders average company tenure was 10.6 years and average age was 40 years; 92.2% were male, 32.8% had doctoral degrees, 21.9% had master degrees, 35.9% had university degrees and 9.4% had higher education degree.

3.3.2 Measures

To avoid problems with common method bias, I used the following approaches. First, because one of the major causes of common method variance is obtaining measures of both predictor and dependent variables from the same rater (Podsakoff, et. al., 2003), data were collected by two separate questionnaires: one for team members and the other for their leaders. Leaders were asked to evaluate team innovation and because the data came from different sources I linked them together with identifying variable (team ID). Secondly, I allowed the respondents' answers to be anonymous (within the team). In addition, I assured respondents that there are no right or wrong answers and that they should answer questions as honestly as possible. These processes should make people less likely to edit their responses in order to be more socially desirable, tolerant, compliant, and consistent with how they think the researcher wants them to respond.

All items used in the study are part of a larger-scale questionnaire; the respondents would therefore likely not have been able to guess the purpose of the study and force their answers to be consistent. Aditionally, nine items in questionnaire were reverse-coded. Additionally, I also made back translation for the questionnaire (Brislin, 1986) in order to prevent losing the meaning of the sentence.

Individual perception of team intuition was measured using seven items adapted by Dayan and Elbanna (2011) measurement scale and was measured using aggregated responses from multiple team members (without leaders). Responses for this scale were based on a 5-point scale ranging from 1 "not at all" to 5 "to large extent". Items included "*To what extent did participants in this project rely basically on personal judgment*"; and "*Did team members put a lot of faith in their initial feelings about other people and situations"* ($\alpha = .90$).

Individual perception of team need for cognition was measured using eighteen items adapted Cacioppo et al. (1996) measurement scale and was measured using an additive composition model (Kearney et al., 2009) in which the team-level construct is the mean of the individual characteristics (Chan, 1998). Responses for this scale were based on a 5-point scale ranging from 1 "extremely uncharacteristic" to 5 "extremely characteristic". Items included "*I would prefer*

complex to simple problems" and reverse coded questions like "*Thinking is not my idea of fun*" (α = .93).

Individual perception of psychological safety was measured using a seven-item scale based on Edmondson (1999). Team members were asked whether they have a sense of confidence that the team will not humiliate, reject, or discipline someone for expressing heir opinion. Responses for this scale were based on a 7-point scale ranging from 1 "very inaccurate" to 5 "very accurate". Sample items include ''*Members of this team are able to bring up problems and tough issues''* and reverse coded questions like *''If members make a mistake on this team, it is often held against you''* (α = .89).

Team innovation: I operationalize team idea generation as the combination of the quantity and quality of ideas that are developed (Eisenbeiss et al., 2008). Team idea generation was measured using 11 items from Eisenbeiss et al. (2008) measurement scale. Team leaders had to indicate quantity and quality of ideas developed within the team. Scales ranged from 1 to 7 but the anchors varied depending on the question. Sample items include "*My team generates ideas about new targets or objectives*" or "*My team generates ideas about new products or product improvements"* ranged from 1 "no new ideas generated" to 7 "many new ideas generated" (α = .96).

Control variable: I controlled for team-aggregated values of member's gender, age, country of residence, level of education, and tenure (years in the company).

I controlled for gender, as there is indication (in line with my sample) that there are less women than there are men in technology-oriented firms, which could possibly present further challenges for women in such companies (Eden, 1992). I controlled for age since as Kanfer and Ackerman (2004) showed that motivation vary across one's lifespan. I also controlled for country of residence since I was interested if there are any major differences between employees living in different countries. In addition, employees with higher education are more likely to be capable to generate and implement new innovative ideas. Furthermore, I controlled for team size, since larger teams usually deal with more complex tasks, which could challenge innovation processes

(Chen et al., 2013). Finally, employees' organizational tenure will more probably affect their positions toward innovation. More tenured employees may experience stronger psychological commitment to the companies' position and values (Staw & Ross, 1980). Therefore, they may resist the changes (descriptive statistics are presented for all variables in Table 5 below).

3.4 Results

I tested my hypotheses and they predict significant relationships among the variables associated with innovation: intuition, NFC, and psychological safety. The correlations among these variables, presented in the Table 5.

Table 5: Descriptive statistics and Inter-Item Correlation Matrix

	Mean	St. dev.	Reliabilities (Cronbach alpha)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Gender	1.85	0.35	n.a.	1									
2. Country	1.43	0.50	n.a.	.23**	1								
3. Age	2.01	0.63	n.a.	0.01	.42**	1							
4. Education	4.17	0.75	n.a.	0.14	.59**	.24**	1						
5. Tenure	3.15	1.06	n.a.	-0.01	.44**	.65**	.18*	1					
6. Team Size	3.28	1.20	n.a.	0.02	.44**	.25**	.15*	.26**	1				
7. Team Intuition	3.28	0.73	0.92	0.01	.35**	0.05	0.13	.21**	.15*	1			
8. Team NFC	3.77	0.72	0.93	0.04	.15*	-0.11	-0.07	-0.09	0.01	.67**	1		
9. Psychological Safety	5.58	0.70	0.89	-0.09	-.49**	-.32**	-.50**	-.42**	-.17*	-0.14	.15*	1	
10. Team Innovation	4.25	0.97	0.96	0.04	0.019	-0.11	-0.02	-0.08	0.06	.60**	.65**	0.09	1

Note Level-1 n = 185, level-2 n = 64, *correlation is significant at the $p < 0.05$ level, **correlation is significant at the $p < 0.01$ level.

I analyzed the data using multivariate hierarchical regression analysis (Table 6 summarizes the multivariate hierarchical regression results). Model 1 in Table 6 includes control variables: gender, age, country of residence, level of education, tenure, and team size and they accounted for 5% of the total variance in team idea generation, $F = 1.56$, $p = .16$. However, neither gender ($B = .19$, $SE = .21$, $\beta = .07$, $p = .38$), country of residence ($B = .27$, $SE = .23$, $\beta = .13$, $p = .24$), age ($B = -.16$, $SE = 0.16$, $\beta = -.10$, $p = .30$), level of education ($B = -.13$, $SE = .13$, $\beta = -.09$, $p = .30$), tenure ($B = .03$, $SE = .09$, $\beta = .03$, $p = .78$), or team size ($B = .12$, $SE = .07$, $\beta = .15$, $p = .08$) were significantly related with team idea generation.

After entering control variables (gender, age, country of residence, level of education, tenure, and team size) in Step 1, I aggregated individuals' perception of team intuition and NFC in Step 2. The regression at the higher level of analysis required the use of aggregated scores, so I aggregated individuals' perception of intuition (Mean rwg = .87, SD rwg = .18; ICC[1] = .71, ICC[2] = .87, $F = 7.99$, $p = .000$) and individuals' NFC to the team level (Mean rwg = .76, SD rwg = .37; ICC[1] = .64, ICC[2] = .84, $F = 6.12$, $p = .00$) and they both yielded acceptable values. Bliese (2000) claims that when ICC(1) is large (as in my case), a single rating from one individual will likely provide a quite reliable rating of the group mean. High ICC values show that members have a very high level of agreement. They accounted for additional 44.6 % of explained variance in team idea generation, $F = 17.74$, $p = .00$ (see Table 6, Model 2). The inclusion of a two-way interaction term (Team intuition × Team NFC) in a third step added significantly to the explained variance of team innovation, $\Delta R^2 = .03$, $F = 14.70$, $p = .00$ (see Table 6, Model 3). Therefore, hypothesis 1 was confirmed.

To demonstrate the form of the two-way interaction, I created two combinations of individuals' perception of team intuition and idea generation (at one standard deviation above and below the mean) and plotted one team intuition – team idea generation slope for each group. As illustrated in Figure 4, the relationship between team intuition and team innovation is moderated by perceived team NFC. Positive relationship between individuals' perceptions of team intuition and team idea generation was found for employees reporting low and high levels of team NFC. These findings suggest that team NFC is of vital importance for facilitating team idea generation

in settings where levels of perceived team intuition are low. The slopes for the team NFC groups were significantly different from each other (t = - 2.99, p = .003), as the interaction is significant.

The results of the regression analysis were plotted in Figure 5. As shown in Figure 4, at low level of team intuition, participants with high team NFC have a higher rate of team idea generation than those with low NFC. The slope of the team intuition team idea generation relationship for high and low NFC is positive but significant only for low NFC ($p < 0.05$). These results imply that in teams with perceived low levels of NFC, an increase in team idea generation was a consequence of increase in team-level intuition ($\beta = .463$, $t = 5.241$, $p = .000$). If teams perceived high levels of NFC, their team idea generation remained stable, no matter how high or low they team intuition was ($\beta = .125$, $t = -1\ .079$, $p = .282$).

Figure 4: The moderating role of individuals' perception of team NFC on relationship between team-level intuition and team idea generation at −1 SD (low) and +1 SD (high) of the centered means.

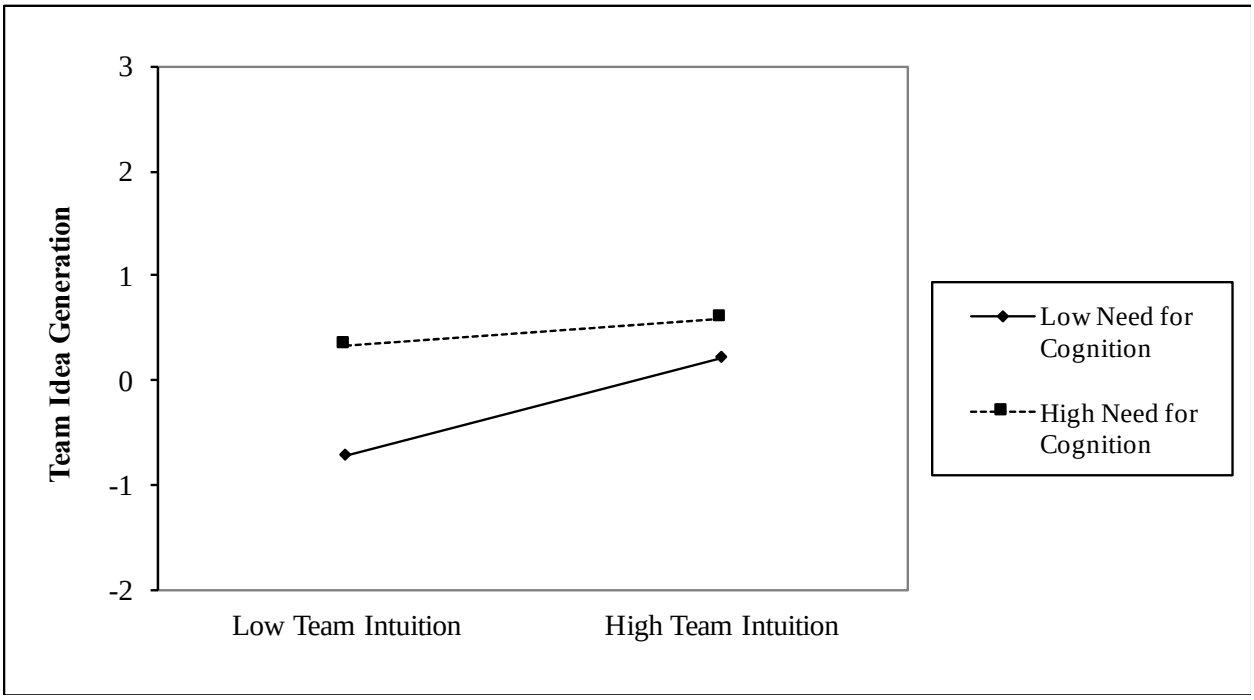


Table 6: Results of multivariate hierarchical regression analysis

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1. Gender	.06 (.08)	0.11 (.06)	.08 (.06)	.11* (.17)	.13* (.17)	.14* (.17)
2. Country	.06 (.11)	-0.29** (.91)	-.22* (.09)	-.23* (.19)	-.16 (.19)	-.18 (.19)
3. Age	-.14 (.10)	0.00 (.08)	-.02 (.08)	.04 (.12)	.01 (.14)	.02 (.14)
4. Education	-.03 (.09)	0.12 (.07)	.11 (.07)	.02 (.10)	.02 (.10)	.04 (.10)
5. Tenure	-.02 (.10)	-0.03 (.08)	-.15* (.09)	-.02 (.08)	-.08 (.09)	-.06 (.09)
6. Team Size	.08 (.08)	0.13* (.06)	.13* (.06)	.19** (.06)	.16* (.05)	.16** (.05)
7. Team Intuition		0.37** (.08)	.29** (.09)	.40** (.09)	.43** (.09)	.45** (.09)
8. Team Need for Cognition		0.39** (.08)	.36** (.08)	.35** (.08)	.22* (.09)	.16 (.10)
9. Team Psychological safety				-.08 (.07)	-.04 (.07)	.05 (.08)
10. Team Intuition x Team Need for Cognition			-.23** (.06)		-.16 (.06)	-.11 (.07)
11. Team Intuition x Team Psychological safety					22** (.08)	.13 (.09)
12. Team Need for Cognition x Team Psychological safety			.		-.03 (.09)	.04 (.09)
13. Team Intuition x Team Need for Cognition x Team Psychological safety						-.17* (.05)

Note: Level 1 n = 185, level 2 n= 64, values are standardized coefficients, with standard errors in parentheses.

Team idea generation is the dependent variable.

*correlation is significant at the $p < 0.05$ level, **correlation is significant at the $p < 0.01$ level and ***correlation is significant at the $p < 0.001$.

To test hypothesis 2 I first entered control variables (gender, age, country of residence, level of education, tenure, and team size) in Step 1 and then in Step 2 I entered aggregated results from individuals' perceptions of intuition, NFC and psychological safety (Mean rwg = .84, SD rwg = .25; ICC[1] = .74, ICC[2] = .89, F = 9.28, p = .00), which yielded acceptable values also at the team level. They accounted for 45.26 % of explained variance in team idea generation, F = 16.10, p = .00 (see Table 6, Model 4).

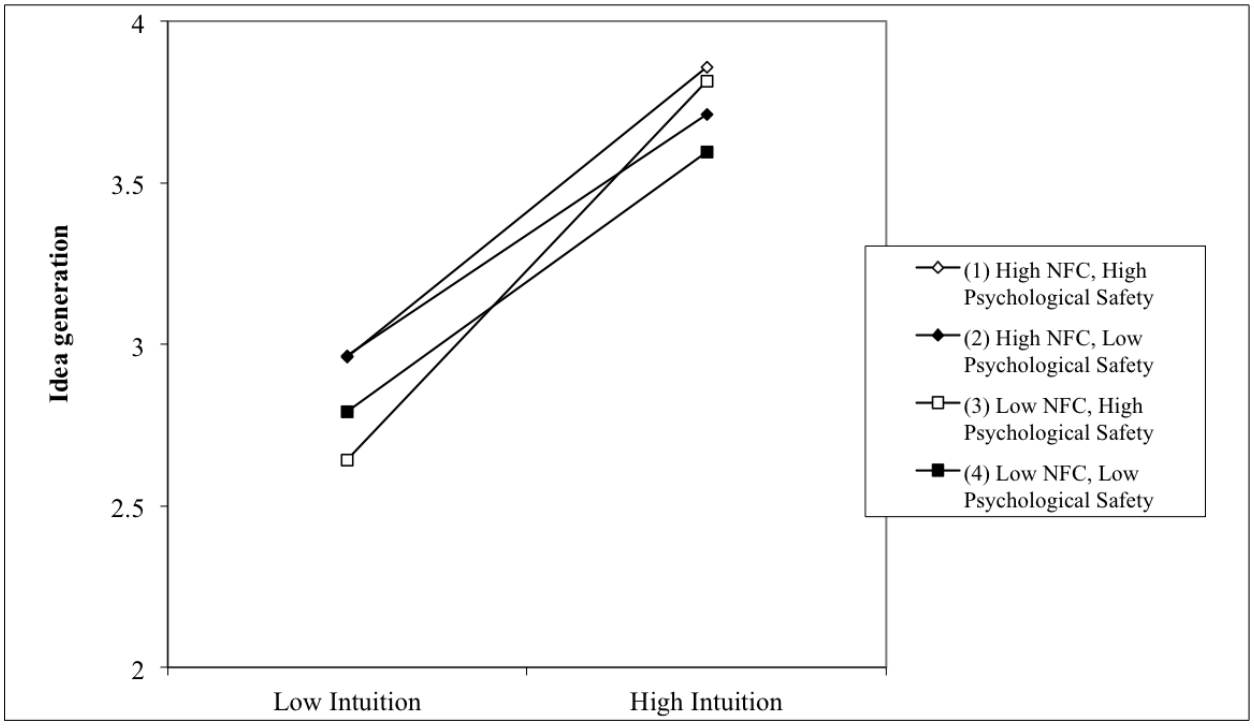
The inclusion of all three two-way interaction terms (Team intuition × Team NFC, Team intuition × Team psychological safety, Team NFC × Team psychological safety) in a third step added significantly to the explained variance of team innovation, ΔR^2 = .05, F= 14.70, p = .00 (see Table 2, Model 5). Finally, in step 4, the three-way interaction term (Team intuition x Team NFC × Team psychological safety) was entered into regression. The three-way interaction term was statistically significant (t = - 2.73 1, p < .05). Whereas the addition of the three-way interaction term explained an additional 1.3 % of the variance in team idea generation, leading to a total explained variance of R^2 = .52, and only individual two-way interaction term Team intuition × Team psychological safety was statistically significant (t = 2.71 1, p < .01). The effect of team intuition on team idea generation was moderated by team NFC and psychological safety (see Table 6, Model 6). Therefore, hypothesis 2 was conformed.

To demonstrate the form of the three-way interaction, I created four combinations of individuals' perception of team intuition and idea generation (at one standard deviation above and below the mean) and plotted one team intuition – team idea generation slope for each group. As illustrated in Figure 5, the relationship between team intuition and team innovation is moderated by perceived team NFC and psychological safety. Positive relationship between individuals' perceptions of team intuition and team idea generation was found for employees reporting low and high levels of psychological safety and team NFC. These findings suggest that perception of psychological safety is of vital importance for facilitating team idea generation in settings where levels of perceived team intuition are low.

The slopes for the two high psychological safety groups (Group 1-high team NFC, and Group 3-low team NFC) were significantly different from each other (t = - 2.68, p = .01), suggesting that

high levels of psychological safety in combination with high levels of NFC result in higher levels of team idea generation in the case of high team intuition, but produce lower levels of team idea generation in the case of low levels of team intuition. The slope for low team NFC (Group 3-high psychological safety, and Group 4-low psychological safety) were significantly different from each other ($t = 3.076$, $p < .002$), suggesting that high levels of psychological safety in combination with low levels of team NFC result in higher levels of team idea generation when team intuition is high, but lower levels of team idea generation when team intuition is low, suggesting that high levels of team intuition are more suited for fostering team idea generation in the case of high team NFC and high levels of psychological safety.

Figure 5: The moderating role of individuals' perception of team NFC and psychological safety on relationship between team-level intuition and team idea generation at −1 SD (low) and +1 SD (high) of the centered means.



3.5 Discussion

By drawing upon the theoretical perspectives of personal characteristics (Cacioppo & Petty, 1982; Dayan & Di Benedetto, 2011; Edmondson, 1999; Epstein, 1990), team-level emergent states (Marks et al., 2001) and multi-level theory (Chen et al., 2005; Kozlowski & Klein, 2000), I investigated how individual-level elements (aggregated to team level), as well as their interplay, influence the first phase of team innovation – team idea generation. My findings validated the hypothesis that relationship between individuals' perceptions of team intuition and idea generation is moderated by NFC and psychological safety.

In line with my hypotheses, I found support for three-way interaction of individuals' perceptions of team intuition, NFC, and psychological safety in relation to team idea generation. The forms of interactions demonstrate that the highest levels of idea generation were achieved when teams reported high levels of perceived team intuition, NFC and psychological safety. In contrast, the lowest levels of team idea generation were achieved when teams reported low levels of perceived team intuition and psychological safety, and high levels of team NFC.

3.5.1 Contributions and theoretical implications

This paper establishes the basis and outlines a multi-level approach for researching team idea generation process. I propose that such method offers a more complete interpretation of the interplay between the individual and the team in understanding the innovation processes. The primary benefit of the multi-level approach over the single-level approach includes the possibility to study the interaction of individuals' perception of team-level intuition (experiential system) over perceived levels of NFC (rational system) and psychological safety to achieve higher levels of team idea generation.

I contribute to the literature in three ways. First, theoretical and empirical contribution of the study is linked to the investigation of a very important research question: What impact do individual's experiential and rational system have on team idea generation? My research

contributes to the intersection of the literatures on organizational behavior and innovation management by elaborating the importance of the CEST theory at the team-level innovation management, which posits that a team's actions (and not just an individual's) are driven by three elements: experiential (intuition), rational system (NFC) and perceptions of psychological safety. The highest levels of team idea generation were achieved when teams reported high levels of perceived team intuition, NFC and psychological safety.

My second contribution is to the CEST literature by applying the CEST theory at the group level. As CEST theory proposes both systems are necessary for outcome achievement and my results indicate that individual's experiential and rational system influence team idea generation. My model represents a useful tool to acquire insights into key aspects of the team idea generation process.

The effect of team intuition on team idea generation was moderated by team NFC and psychological safety. Positive relationship between individuals' perceptions of team intuition and team idea generation was found for employees reporting low and high levels of team NFC. Nonetheless, teams achieved higher levels of idea generation when NFC high rather than low. According to Figure 6 the role of NFC is not so important when both, psychological safety and intuition, are high. Hence, when employees have favorable conditions and appropriate levels of predisposition, they do not need to focus and train NFC as intensely as when levels of intuition and psychological safety are lower. These results agree with Hayashi (2001), who claims that for complex and ambiguous decisions senior management needs high levels of intuition rather than to rely on rational, heavily quantitative information processing that has been used at the middle management level.

Finally, my third contribution is the use of emergent constructs at individual level to achieve the team level outcome. Morgeson and Hofmann (1999) suggested that emergent constructs (e.g. group personality) may originate from different sources but maintain similar meanings to their lower-level constructs. Intuition and psychological safety used in the study were aggregated to team level as the referent-shift constructs, whereas NFC was aggregated as summary index model and they all showed sufficient inter-member agreement, which justified the aggregation of

ratings within units to the unit level (Chen et al., 2005). By detecting relatively high and significant ICC(1) results for these measures further indicate that variability is smaller within teams than between teams.

3.5.2 Practical implications

This study has also an important managerial implication. There is an agreement that a key competitive advantage of a company lies in its ability to adapt to changes in business environment. My study highlights the significance of addressing both individual and team contributions when dealing with team-level idea generation. Explicitly, the study suggests that team innovation is influenced by team's perceptions and/or individual personalities.

The theoretical model I outline can help inform organizations and managers how to effectively recruit and train team members and teams as a whole in order to achieve higher levels of team innovation. According to the results, the highest levels of team innovation were achieved when perceived levels of team intuition were high and the teams perceived high levels of NFC and psychological safety. Therefore, increased attention needs to be paid to employees by recruiting innovative individuals and providing supportive environment where employees are motivated and able to seek continuous improvement and search for innovative solutions to problems.

3.5.3 Limitations and future research directions

While the above findings make several significant contributions, it is imperative to point out also some of the limitations and debate how they could encourage future research. One of the biggest limitation of my study are the cross-sectional data as they were collected by studying individuals and teams at the same point in time without regard to differences in and I have non-experimental data therefore I could not make casual claims (Antonakis et al., 2010). Furthermore, although I have empirically tested and cited several studies that support hypotheses in the model throughout the paper, the results should be viewed with caution in light of the smaller sample size.

Therefore, feasibility of the model and its ability to complement and extend existing theories should be tested in a large-scale study also in countries outside central Europe. It is important to now go further; as such research would additionally extend our knowledge about the innovative process.

While I was able to explain that the team- and individual- inputs studied here (i.e. intuition, NFC, psychological safety) have an important impact on team idea generation, I acknowledge that other factors, which I did not take into consideration could also explain team innovative performance. For example, I did not assess other personal characteristics (e.g. efficacy beliefs, proactive personality) and team-level factors that might affect this relationship (e.g. team level leader-members exchange, influence tactics, supportive supervision). Therefore, additional studies are needed to build on my model of multi-level teams innovation processes, and take into account further antecedents that encourage innovation across different levels of analysis.

3.6 Conclusion

The present study presents important aspects for scholars as well as practitioners working in the field of innovation. I applied a multi-level approach as I wanted take preliminary steps in improving and developing a more comprehensive view of team innovation that comprised emergent influences of individual members on their teams. Results of my study showed that intuition was associated with team idea generation. I took this analysis a step further by taking into account how NFC and psychological safety might moderate this relationship as it enables a working environment where risk-taking approaches are valued and innovation is given a high priority. My findings are in line with the idea that intuition, NFC, and psychological safety promote team innovation. I hope this work will encourage future multi-level studies associated to individual personalities and team innovation.

Chapter 4: THE ABILITY–MOTIVATION–OPPORTUNITY FRAMEWORK FOR TEAM INNOVATION: EFFICACY BELIEFS, PROACTIVE PERSONALITIES, SUPPORTIVE SUPERVISION AND TEAM INNOVATION

In chapter four, I deal with the micro-level foundations of team innovation at the individual level. It is based on ability–motivation–opportunity (AMO) theoretical framework. The AMO framework is assembled from basic concepts of psychology: 1) motivation has been perceived as the incentive toward a behavior; 2) ability as skills and capabilities essential to the performance of a behavior; and 3) opportunity as contextual and situational constraints relevant to the performance of the behavior. The study explores the interplay among team members' proactive personalities (abilities), collective efficacy (motivation), and supportive supervision (opportunity), and their interaction in predicting team innovation.

I propose and test the relationship with a multi-level study of 249 employees nested within 64 teams from one German and three Slovenian hi-tech companies. Results showed that collective efficacy was positively related to team innovation. In addition, in line with my hypothesis, I found support for a three-way interaction of individuals' perceptions of collective efficacy, team proactivity and supportive supervision in relation to team innovation.

My findings largely validated the hypothesis that relationship between individuals' perceptions of collective efficacy and team innovation is moderated by proactive personality and supportive supervision. The form of interaction demonstrates that in situations with high supportive supervision, proactive personality results in highest levels of team innovation in both levels of collective efficacy, but produce a negative line of the relationship, suggesting that low levels of collective efficacy are more suited for fostering team innovation in the case of high supportive supervision and high proactivity. Implications for practice and future research are discussed.

4.1 Introduction

Studies highlighted innovation as one of the primary sources of competitive advantage where the chances of an organization to survive, to be successful and effective in challenging environments are becoming ever more dependent on innovation (Amabile, 1993; Anderson & King, 1991; Chi, Huang, & Lin, 2009; Post, 2012). Yet, innovation is a complex, multilevel, and emergent phenomenon that requires skillful leadership in order to maximize the benefits of new and improved ways of working (Anderson, Potočnik, & Zhou, 2014). With business processes becoming more complex, organizations reorganized work around teams in order to provide faster and more flexible responses to changes in environment (Kozlowski & Ilgen, 2006).

Teams have become the basic organizational working unit (Chen et al., 2002), and over 80% of today's work in Fortune 1000 companies is based on a team-work (Hollenbeck et al., 2012). Therefore, teams are the ones who usually propose new ideas and pursue the ideas toward implementation. For any creative proposal to be worked up toward an organizational-level innovation, these meso-analytical influences are particularly important (Anderson & King, 1993; Hulsheger et al., 2009; Shalley & Gilson, 2004). Even if the importance of innovation has been recognized by scholars, businesses and governments, too little attention is being devoted to organizational teams and how they can facilitate or inhibit innovation (Anderson & West, 1998; Eisenbeiss et al., 2008; Somech & Drach-Zahavy, 2011).

Team environments can foster collaboration and form a desirable basis for implementing new ideas (Černe, Jaklič, & Škerlavaj, 2013b), which is why the ability to function effectively as a team member has become vital. Axtell et al. (2000) theorized the importance of efficacy beliefs as an important driver of team innovation. In addition, team proactivity was positively linked to a number of important team-level outcomes (Crant, 2000; Kirkman & Rosen, 1999). And finally, Hulsheger et al. (2009) preformed a meta-analysis that acknowledged support for innovation as one of the strongest antecedents of team innovation. As such, it is important to understand different drivers as well as their interactions with team innovation across micro and meso-levels.

Innovation research has only recently predominantly focused on company-level outcomes—performance, growth, profit, etc. Both situational and personal elements predict innovation (Chen et al., 2013; Somech & Drach-Zahavy, 2011). The dynamics behind team innovation indicate that individuals are the ones who usually generate new ideas or improved ways of doing things (West, 1987), whereas the team context could considerably influence the implementation of ideas (Scott & Brouce, 1994). Hence, team innovation success depends not only on members individually but also on their combined skills and ways of approaching and solving problems.

It has been separately shown that efficacy beliefs and support for innovation influence team innovation (Axtell et al., 2000; Hulsheger et al., 2009), but I do not yet know the nature of their joint effects and how are they related with team members' proactivity. Scholars have applied the ability-motivation-opportunity (AMO) model (Appelbaum et al., 2000) mostly at the individual-level; however, it can also be applied to explain team-level outcomes. My understanding of innovation as a broader, multi-level phenomenon therefore needs to address important interactive questions, such as "How do the employees' motivation, ability and opportunity interplay in influencing team innovative outcomes?"

In order to fully address this question and to understand the factors that could facilitate or inhibit team innovation, I outline and test a multi-level model by building upon the AMO model. The AMO framework is built from basic concepts of psychology: motivation has been perceived as the incentive toward a behavior; ability as skills and capabilities essential to the performance of a behavior; and opportunity as contextual and situational constraints relevant to the performance of the behavior. Efficacy beliefs can be perceived as an adjacent motivational mechanism by reflecting the degree to which individuals perceive themselves as being able of completing tasks and how it motivates them to engage in innovative behaviors (Bandura, 1997; Chen et al., 2013). The proactive personality is a personal disposition toward proactive behavior (Bateman & Crant, 1993). Proactive personality is a relatively stable propensity involving expressing initiative, recognizing opportunities, being active, and persisting in efforts to endorse change (Bateman & Crant, 1993).

Proactive individuals possess creative, self-responsible, positive thinking skills, they are pathfinders who find and solve problems (Leavitt, 1988). I argue that proactive personality signifies the skills for an individual to engage in active changing of the work environment. Hence, it reflects ability as it represents skills and knowledge related to the action. Finally, supportive supervision reflects opportunity to perform, as opportunity denotes the invitation to participate and take part, or get involved. Leaders with their behavior (Collings & Mellahi, 2009) can create opportunity to encourage employees' personal and professional growth (Contino, 2004), enable employees' skill development (Deci & Ryan, 1987) and create opportunities to participate. Under supportive supervision, work environment provides team members needed support.

My analysis widens understanding of how the team setting can inspire individual members to take part in team innovative behavior. Additionally, I produce new understanding of how leadership support and member abilities can concurrently motivate team members to perform innovatively. Therefore, I propose that it is of an outmost importance to concurrently examine at multi-levels what drives team members to engage in team innovation process.

Thus, my main aim is to contribute to the literature by investigating the joint influence of team proactivity, efficacy, and perceptions of supportive supervision on team innovation. First and most generally, by building upon the AMO framework and adopting a micro-meso viewpoint that incorporates models of individual beliefs, personalities, support, and team innovation, I try to contribute to the innovation literature by presenting a more comprehensive interpretation of team innovation. In addition, I also contribute empirically to the leadership and innovation literature by suggesting certain leadership practices and by exploring the combined role of structural and interpersonal conditions for team innovation by clarifying the mechanisms through which individuals influence innovation.

Second, an important theoretical contribution of the paper is in applying the AMO model, generally investigated and used at the individual level, to the team level. I believe that the three-way interaction model proposed here represents a useful application of this approach to acquiring insights into key aspects of the team innovation process. And finally, my third contribution is to

multi-level theory by incorporating emergent constructs at the individual level to achieve the outcome on team level. Beyond theoretical basis among team innovation models, I posit that the multi-level approach is likely to account for differences in team idea generation process better than would individual- or team-level models alone. Thus, by adopting a multi-level viewpoint, I try to contribute towards a more holistic and integrated understanding of the innovation process as a whole.

4.2 Theoretical background and hypothesis

The dynamics of today's discontinuous, complex, and global economy have challenged the doctrines of traditional business operations. Organizations can no longer remain static, they must constantly adjust and redefine themselves. The AMO framework has become an established theoretical basis for explaining work performance (Blumberg & Pringle, 1982). Organization needs to increase employees' abilities, motivation and opportunities to participate in order to effectively enhance employees' innovative behavior, as those are critical to direct the effort towards the desired outcome.

AMO model proposes that ability dimension (proactive personality) of the model guarantees that employees have the appropriate skill levels to use the opportunity to engage in active changing of the work environment. Employees also need the motivation (collective efficacy) to use the elective effort, and the opportunity (supportive supervision), which refers to involvement in the decision-making process of the company (Appelbaum et al., 2000).

Additionally, Hutchinson (2013) argues that ability can be influenced by recruitment and selection to ensure that capable employees are recruited in the first instance, and by training, learning and development. Motivation can be influenced by extrinsic (e.g. financial) and intrinsic rewards (e.g. interesting work) performance reviews, feedback, and work– life balance. Opportunity can be influenced by communication, involvement initiatives, team working, and autonomy.

4.2.1 Efficacy beliefs

Although researchers have conceptualized efficacy beliefs at multiple levels of analysis, only limited bottom-up multi-level research has been conducted (Chen & Bliese, 2002; Tasa, Sears, & Schat, 2011). There is strong support in existing literature, that efficacy beliefs are not isomorphic at individual and team levels as elements that form the development of collective efficacy are not the same as are the antecedents of self-efficacy (Chen & Bliese, 2002), and perception of *"can I accomplish this task?"* is different from *"can we accomplish this task?"* (Mischel & Northcraft, 1997).

Perceived efficacy beliefs play a crucial role in individual's and team's functioning by affecting behavior of each person directly and indirectly (Fernández-Ballesteros, Díez-Nicolás, Vittorio Caprara, Barbaranelli, & Bandura, 2002). They influence the way people think, whether they think unpredictably or strategically, whether they see situations optimistically or pessimistically, how high they set their goals, and how much effort and commitment they put forth to achieve them (Bandura, 2000). However, people commonly do not live their lives in autonomy, and many of their goals are achievable only through interdependent efforts of their team. Hence, they have to work together with other team members, coordinating their actions to accomplish together what they are not able to do on their own, and they will most probably be influenced by the views, motivation, effectiveness, and performance of their colleagues.

Collective efficacy is both a cognitive product arising out of group interaction and a motivational force in teams (Tyran & Gibson, 2008). It refers to "*a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments*" (Bandura, 1997, p.477). Therefore, the core of perceived collective efficacy resides in the minds of team members because the team operates throughout the behavior of its individual members (Bandura, 2000). Research has demonstrated that teams with a strong group belief in their ability are more effective (Tyran & Gibson, 2008). Indeed, expectations of efficacy beliefs define the extent of individuals' task-related effort and whether and for how long they persevere. Bandura (1997) argued that is important to differentiate between possessing skills and being capable of using them well. In order for a team to be successful, team members have to

believe in their capabilities to exercise control over events to accomplish desired goals. Therefore, teams with the same skills may perform poorly, adequately, or extraordinarily, depending on whether their perceived collective efficacy beliefs boost or harm their motivational state (Bandura, 1990).

Consistent with Gully, Incalcaterra, Joshi, and Beaubien (2002) and others (e.g., Jex & Bliese, 1999; Parker, 1994), I suggest that collective efficacy perceptions reside within individuals and therefore propose to measure it at the individual level and aggregate it to the collective level. Collective efficacy discusses individual members' perceptions of their team's competency (Bandura, 1986) or aggregated capability to effectively complete a chosen task (Guzzo, Yost, Campbell, & Shea, 1993). Therefore, collective efficacy beliefs develop into homogenous beliefs due to regular contacts and mutual experiences. Individuals working in the team are likely to be a part of the same process and collect similar information (Hinsz et al., 1997). As result, all members probably concentrate on similar information when assessing their collective efficacy leading to emergence of collective efficacy as a shared referent-shift construct (Chan, 1998; Chen et al., 2005), where the referent of collective efficacy shifts from individual to team level.

In teams, it is especially important to observe collective efficacy as research found that efficacy beliefs determine whether an individual will decide to engage in certain behavior, and if so, how much effort will be invested to accomplish particular tasks (Bandura, 1997). Efficacy beliefs positively predict teamwork behaviors displayed by team members (Tasa, Taggar, & Seijts, 2007), team outcomes (Gully et al., 2002), job attitudes, and job performance (Chen et al., 2002). The sense of confidence generated by high levels of efficacy helps teams carry on when facing difficulties. It also motivates members to engage in innovative behaviors (Griffin, Neal, & Parker, 2007), as it seizes sureness in the capability to create and implement new ideas. In line with theoretical arguments suggesting that efficacy beliefs capture sureness in the capability to create, encourage and implement new ideas, Chen et al. (2013) found a positive relationship between efficacy beliefs and individual innovative performance. This justifies my focus on efficacy belief for the present study.

4.2.2 Proactive personality

Employees' proactive personality is more and more important for organizations looking for adapting and surviving in uncertain business environments (Bal, Chiaburu, & Diaz, 2011; Grant & Ashford, 2008; Parker, Bindl, & Strauss, 2010). As the importance of teamwork is increasing in last decades, I focus on team proactivity, a behavioral propensity concerning presenting initiative, recognizing opportunities, taking action, and insisting in efforts to create change (Bateman & Crant, 1993). Study made by Williams, Parker, and Turner (2010), showed that the most proactive teams had individuals with higher-than-average proactive personality and lower heterogeneity in proactive personality.

Team proactivity characterizes the team rather than individual members of the team. Team proactivity has theoretical resemblance with individual-level proactive personality and hence defines the level to which a team take part in self-initiating, future-oriented action that aims to transform the external situation or the team. Team proactivity is focused how team behaves as a whole, that is, as an interdependent and goal oriented grouping of individuals (Morgeson & Hofmann, 1999).

As such, team proactivity is not the same as the sum of individual proactive team members but is collective in emphasis. There might be proactive members within a team, but unless their effort is coordinated, the team itself might not be proactive. It is the mean of individual proactive personality measure aggregated to the team level (Parker & Sprigg, 1999). Team proactivity develops into emergent, homogenous construct due to regular contacts and interactions of team members (Williams et al., 2010). Throughout these relations, members create common and permanent means of reacting to challenges.

Proactive team members put forward ideas on work improvement and suggestions how to avoid problems. Consequently, interaction amongst proactive team members likely encourages team discussions, which lead to the generation and implementation of collective ideas. I therefore propose that team proactivity emerges as a consensus construct (Chan, 1998; Chen et al., 2005;

Williams et al., 2010), as it maintains the same meanings across different levels of analysis, and it uses an individual as the construct's referent.

Team proactivity can be viewed as a moderating mechanism on the relationship between collective efficacy and team innovation. Indeed, proactive personality has been shown to relate positively to innovation and to influence the transition from idea generation to idea implementation (Seibert, Kraimer, & Crant, 2001). Furthermore, Sheikhiani, Bindu, and Fakouri (2011) argued that proactive personality is one of the most important factors that has an impact on efficacy beliefs.

Perceptions of efficacy beliefs may facilitate beneficial outcomes, such as innovation, when combined with proactive personality (Chen et al., 2013). Accordingly, while perceived team proactivity should represent an important condition for individual perceptions of collective efficacy to predict team innovation, its impact may depend on the level of perceived supervisory support. Studies report reciprocal relationship between team innovation and supervisory support (Ettlie, 1983; Mohamed, 2002), as rapid changes in business environment call for faster innovations (Mohamed, 2002). Therefore, to remain competitive, it is crucial to obtain innovation support of supervisors.

4.2.3 Supportive supervision

According to organizational support theory (Eisenberger, Huntington, Hutchison, & Sowa, 1986), when an employee believes that his or her organization or immediate supervisor is supportive, the employee will demonstrate more favorable work-related attitudes and behaviors (Marique, Stinglhamber, Desmette, Caesens, & De Zanet, 2013; Wang, Walumbwa, Wang, & Aryee, 2013).

Support for innovation portrays the "*expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment*" (West, 1990b, p.315). In a business environment where supervisor supports innovation, unsuccessful innovation

efforts are expected to be better tolerated, and members of the team will more probably take risks to implement new ideas (Sethi et al., 2001). Supervisory support is exhibited through various behaviors, such as creating opportunities to participate, strengthening the group's collective skills and approach, clarifying purpose and goals, building commitment, removing externally-imposed obstacles, and creating opportunities for performance (Katzenbach & Smith, 1993).

Supportive supervision is hence a variable that reflects the extent to which supervisor of the team displays supportive behaviors. If team members hold similar perceptions of supportive supervision, it is operationalized as a group-level construct. Supportive supervision develops into a homogenous construct due to regular contacts within the team and its perceptions come together in a team, as team members are subject to the same set of organizational influences and because these opinions develop out of mutual events. I therefore propose that supportive supervision emerges as a shared referent-shift construct that maintains the same meanings across different levels of analysis but it uses the aggregate – not the individual – as the construct's referent (Chan, 1998; Chen et al., 2005).

Research on supportive supervision has examined several dimensions of supervisory process, including its effect on efficacy beliefs. Supervisors who enable subordinates to understand their goals and assist in their goal realization contribute to their subordinate's experiences (Ballantine & Nunns, 1998). As a result, supportive supervision contributes to perceptions of efficacy beliefs, and supportive behaviors are likely to enhance individual perceptions of collective efficacy.

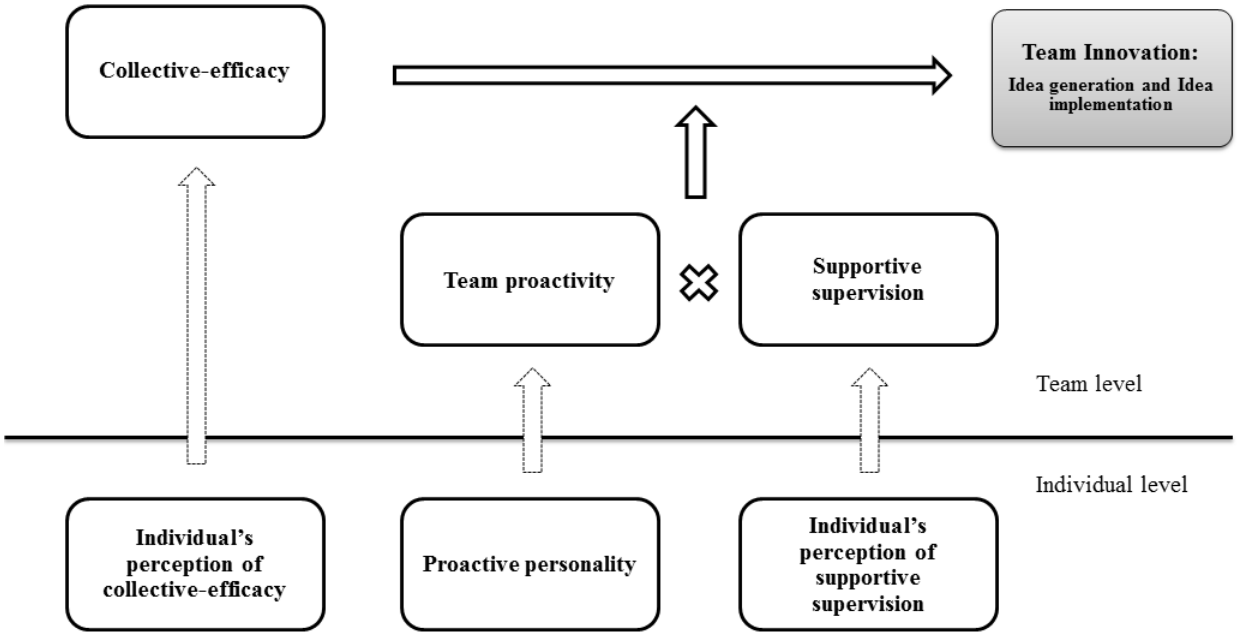
Supportive supervisors promote a safe environment for team members to express novel and original ideas as well as provide them with the resources to do so effectively (Hunter & Cushenbery, 2011). During the implementation phase, supervisors support some ideas whereas discarding others and push the ones that do appear viable into the production phase. Supportive supervision creates opportunities for team members' investigative and critical reasoning processes, and so it may create an environment where unusual and risk-taking methods are respected and innovation is given high priority. In addition, the goal of supportive supervision is to guide team members to expend their effort and go beyond the predicted.

Based on the considerations above, I expect a three-way interaction between individuals' perceptions of collective efficacy, team proactivity and supportive supervision in relation to team innovation. The interaction postulated by the AMO model (i.e., the outcome is a function of ability, motivation and opportunity) should hold for individuals' perceptions of collective efficacy, team proactivity and supportive supervision. I propose that individuals' perceptions of collective efficacy can be perceived as a motivational tool through which team innovative behavior is influenced.

In addition, although team members may have an accurate assessment of their capabilities, they may not necessarily engage in innovative behaviors if they lack proactive personality. To successfully achieve the desired outcome, team must possess the belief that they are capable of achieving the goal. However, without proactive actions, team members less likely overcome barriers that they are facing. Hence, it is reasonable to expect a positive relationship between collective efficacy and team innovation to be contingent upon team proactivity.

Furthermore, perceived supervisor support can, for instance, represent a condition under which the supervisor creates opportunities for employees not to be afraid of taking risk, trusting in their collective capabilities and proactively responding to different situations. Supportive supervision decreases job stress that interferes with work performance and provides team members with opportunities that encourage their collective efficacy. This, in turn, should make members reporting high levels of proactive personality more willing to introduce new work methods, prevent and react to problems, and scan the environment to identify potential opportunities implied by perceptions of collective efficacy. On the other hand, if members perceive lower levels of supervisory support, they might feel less secure in their work role, regardless of their belief in their collective capabilities and proactive personality (see Figure 6).

Figure 6: Efficacy beliefs, proactive personality, supportive supervision and team innovation



I therefore hypothesize the following:

Hypothesis: *The relationship between individuals' perceptions of collective efficacy and team innovation is moderated by individuals' perceptions of team proactive personality and supportive supervision. Specifically, collective efficacy more strongly relates to team innovation at higher levels of perceived team proactive personality and supportive supervision.*

4.3 Research method

4.3.1 Sample and procedures

Participants were 249 employees (185 team members and 64 team leaders) working in 64 research and development teams from a German hi-tech electronics company and three Slovenian hi-tech biotechnology, electronics, and IT companies. Studied companies varied by size (from small, medium to large enterprises) with range of employees from 50 to more than 10.700. I surveyed research and development teams among companies from information technology, telecommunication, biotechnology and electronics industries, which allowed us to control for industry-level differences that could influence the success of team innovation

Also, I worked closely with team leaders in all companies to make sure that each surveyed team (a) was first and foremost responsible for research and development activities, (b) comprised of team members with diverse functions who worked together towards collective goals, and (c) team members worked together for a minimum of two months so that common opinions of their team leader and behavior can emerge. By being such, teams were alike in crucial design features, like membership of the team, tasks' types and interdependence. A comparison of respondents to non-respondents provided no evidence of response bias.

Complete data were obtained from 185 team members (71% response rate) and 64 team leaders (83% response rate) of 77 research and development teams in four companies. The average size of the team (n = 64) in the final sample was 3.28 (range = 2 to 6 members per team). The average company tenure of members was 7.5 years and average age was 35 years; 85% were male, 7.6% had doctoral degrees, 30.8% had master degrees, 40.5% had university degrees, 15.2% had higher education degree, 4.3% had high school degrees and 1.6% had professional middle school degrees. Of team leaders average company tenure was 10.6 years and average age was 40 years; 92.2% were male, 32.8% had doctoral degrees, 21.9% had master degrees, 35.9% had university degrees and 9.4% had higher education degree.

4.3.2 Measures

To avoid problems with common method bias, I used following approaches. First, because one of the major causes of common method variance is obtaining measures of both predictor and dependent variables from the same rater (Podsakoff, et. al., 2003), data were collected by two separate questionnaires: one for team members and the other for their leaders. Leaders were asked to evaluate team innovation and because the data came from different sources I linked them together with identifying variable (team ID). Secondly, I allowed the respondents' answers to be anonymous (within the team). In addition, I assured respondents that there are no right or wrong answers and that they should answer questions as honestly as possible. These processes should make people less likely to edit their responses in order to be more socially desirable, tolerant, compliant, and consistent with how they think the researcher wants them to respond.

All items used in the study are part of a larger-scale questionnaire; the respondents would therefore likely not have been able to guess the purpose of the study and force their answers to be consistent. Aditionally, nine items in questionnaire were reverse-coded. Additionally, I also made back translation for the questionnaire (Brislin, 1986) in order to prevent losing the meaning of the sentence.

Efficacy beliefs: Collective efficacy was measured using seven items that addressed individuals' belief in their team's capabilities to organize and execute the courses of action adapted from and from Riggs, Warka, Babasa, and al (1994). Responses for this scale were based on a 7-point scale ranging from 1 "completely inaccurate" to 7 "completely accurate". Items included ''*The team I work with has above average ability*''; and ''*This team is not very effective"* (α= .92).

Proactive personality: The mean level of proactive personality was measured by aggregating individual proactive personality measure to the team level. Individual-level proactive personality was assessed using four of the highest loading items from Bateman and Crant (1993). This measure has proven reliability and validity (e.g., Bateman & Crant, 1993) and the same abbreviated scale has been used elsewhere (e.g., Parker & Sprigg, 1999; Williams et al., 2010). Responses for this scale were based on a 5-point scale ranging from 1 "*not true at all*" to 5 "*very*

true". Items included: "*If I believe in an idea, no obstacle will prevent me from making it happen*" and "*I am excellent at identifying opportunities*" (α= .93)

Supportive supervision: Supportive supervision was measured using a four-item scale based on Manz and Sims (1987). Team members were asked whether the supervisor encourages employees to engage in self-goal setting, self-reinforcement, self-expectation, and self-observation/evaluation. Sample items include ''*Encourages us to expect a lot from ourselves*'' and ''*Encourages us to set targets for our team performance*'' (α = .89). The 5-point scale ranged from 1 "strongly disagree" to 5 "strongly agree".

Team innovation: I operationalize team innovation as the combination of the quantity and quality of ideas that are developed and implemented and measure it using 22 items from Eisenbeiss et al. (2008) measurement scale. Team leaders had to indicate quantity and quality of ideas developed within the team as well as of ideas implemented. Scales ranged from 1 to 7 but the anchors varied depending on the question. For example, the response for developing ideas, "*My team generates ideas about new targets or objectives*." ranged from 1 "no new ideas generated" to 7 "many new ideas generated". The response for idea implementation, "*How would you assess the quality of implemented ideas according to their novelty*?" ranged from 1 "not at all novel" to 7 "extremely novel" (α = .96).

Controls: Before describing the methodology I used to test the hypotheses, I wish to emphasize that my intention is not to examine a complete model of team innovation, but rather to examine the role of few potentially important variables - namely efficacy beliefs, proactive personality, and supportive supervision. In testing this hypothesis, I acknowledge the role of other variables that may be correlated with innovation and therefore should be controlled for in this study. I controlled for team-aggregated values of member's gender, age, country of residence, level of education, and tenure (years in the company).

I controlled for gender, as there is indication (in line with my sample) that there are less women than there are men in technology-oriented firms, which could possibly present further challenges for women in such companies (Eden, 1992). I controlled for age since as Kanfer and Ackerman

(2004) showed that motivation vary across one's lifespan. I also controlled for country of residence since I was interested if there are any major differences between employees living in different countries. In addition, employees with higher education are more likely to be capable to generate and implement new innovative ideas. Furthermore, I controlled for team size, since larger teams usually deal with more complex tasks, which could challenge innovation processes (Chen et al., 2013). Finally, employees' organizational tenure will more probably affect their positions toward innovation. More tenured employees may experience stronger psychological commitment to the companies' position and values (Staw & Ross, 1980). Therefore, they may resist the changes. Therefore, they may resist the changes (descriptive statistics are presented for all variables in Table 7 on the following page).

Table 7: Descriptive statistics and Inter-Item Correlation Matrix

	Mean	St. dev.	Reliabilities (Cronbach alpha)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Gender_mean	1.85	0.35	n.a.	1									
2. Country_mean	1.43	0.50	n.a.	.23**	1								
3. Age_mean	2.01	0.63	n.a.	0.01	.42**	1							
4. Education_mean	4.17	0.75	n.a.	0.14	.59**	.24**	1						
5. Tenure_mean	3.15	1.06	n.a.	-0.01	.44**	.65**	.18*	1					
6. Team Size	3.28	1.20	n.a.	0.02	.44**	.25**	.15*	.26**	1				
7. CollectiveEfficacy_mean	4.86	0.85	0.92	0.11	.21**	0.07	-0.03	0.08	0.11	1			
8. TeamProactive personality_mean	2.47	0.79	0.93	0.04	-0.07	-0.07	-0.08	-.17*	0.02	.68**	1		
9. SupportiveSupervision_mean	3.69	0.75	0.89	0.04	0.10	.161*	-0.01	.17*	0.08	.62**	.72**	1	
10. Team Innovation	4.25	0.97	0.96	0.04	0.02	-0.11	-0.02	-0.08	0.06	.59**	.73**	.65**	1

Note: Level-1 n = 185, level-2 n = 64, *correlation is significant at the $p < 0.05$ level, **correlation is significant at the $p < 0.01$ level.

4.4 Results

I tested the hypothesis and it predicted significant relationships among the variables associated with innovation: efficacy beliefs, proactive personality, and supportive supervision. The correlations among these variables, presented in the Table 8, indicate that the data were consistent with my hypothesis.

I analyzed the data using multivariate hierarchical regression analysis (Table 8 summarizes the multivariate hierarchical regression results). Because I assumed the demographic variables to be causally prior to all others, I entered them in the first step of multiple hierarchical regression as control variables: gender, age, country of residence, level of education, tenure, and team size; and they accounted for 2.5% of the total variance in team innovation, $F = .75$, $p = .61$. However, neither gender ($B = .06$, $SE = .21$, $\beta = .02$, $p = .78$), country of residence ($B = .15$, $SE = .22$, $\beta = .08$, $p = .51$), age ($B = -.20$, $SE = 0.15$, $\beta = -.13$, $p = .19$), level of education ($B = -.05$, $SE = .12$, $\beta = -.04$, $p = .69$), tenure ($B = -.03$, $SE = .09$, $\beta = -.04$, $p = .72$), or team size ($B = .06$, $SE = .07$, $\beta = .07$, $p = .39$) were significantly related with team innovation.

The regression at the higher level of analysis required the use of aggregated scores, so I aggregated individuals' perception of collective efficacy to the team level and they yielded acceptable values (Mean rwg = .93, SD rwg = .18; ICC[1] = .66, ICC[2] = .85, $F = 6.64$, $p = .00$). I aggregated also results from individuals' proactive personality (Mean rwg = .89, SD rwg = .20; ICC[1] = .76, ICC[2] = .90, $F = 10.15$, $p = .00$) and individuals' perceptions of supportive supervision to the team level (Mean rwg = .83, SD rwg = .21; ICC[1] = .65, ICC[2] = .84, $F = 6.33$, $p = .00$) and they both yielded acceptable values. Bliese (2000) claims that when ICC(1) is large (as in my case), a single rating from one individual will likely provide a quite reliable rating of the group mean. High ICC values show that members have a very high level of agreement.

After entering control variables (gender, age, country of residence, level of education, tenure, and team size) in Step 1, I aggregated individuals' perception of collective efficacy, proactive personality and supportive supervision in Step 2. They accounted for additional 57.1 % of

explained variance in team innovation, F = 28.67 p = .00. The inclusion of all three two-way interaction terms (Collective efficacy × Proactive personality, Collective efficacy × Supportive supervision, Proactive personality × Supportive supervision) in a third step added significantly to the explained variance of team innovation, ΔR^2 = .06, F= 27.39, p = .00. Finally, in step 4, the three-way interaction term (Collective efficacy × Proactive personality × Supportive supervision) was entered into regression. The three-way interaction term was statistically significant (t = 2.01, $p < .05$). Whereas the addition of the three-way interaction term explained an additional 1% of the variance in team innovation, leading to a total explained variance of R^2 = .66, none of the individual two-way interaction term were statistically significant. The effect of collective efficacy on team innovation was moderated by team proactivity and supportive supervision.

To demonstrate the form of the three-way interaction, I created four combinations of individuals' perception of collective efficacy and team innovation (at one standard deviation above and below the mean) and plotted one collective efficacy – team innovation slope for each group. As illustrated in Figure 7, the relationship between collective efficacy and team innovation is moderated by perceived proactive personality and supportive supervision. Negative relationship between individuals' perceptions of collective efficacy and team innovation was found for team members reporting high levels of supportive supervision and high levels of proactive personality. In contrast, a positive relationship between individuals' perceptions of collective efficacy and team innovation was found for employees reporting low levels of supportive supervision and low levels of team proactivity. These findings suggest that supervisors are of vital importance for facilitating team innovation in settings where levels of perceived collective efficacy are low.

Table 8: Results of multivariate hierarchical regression analysis

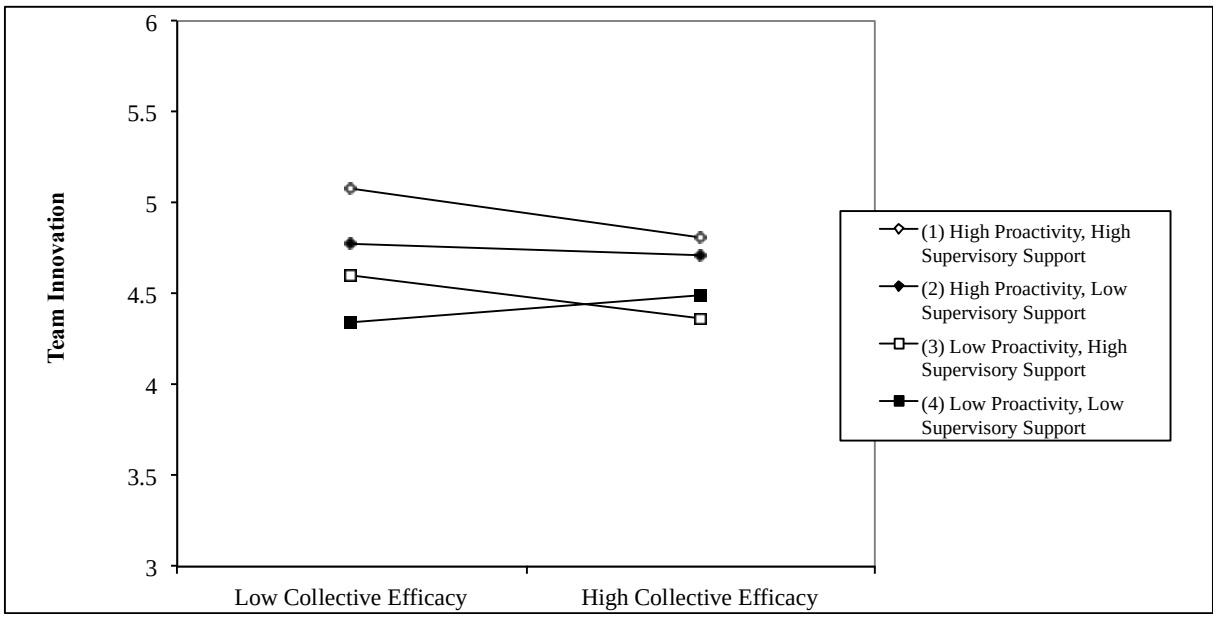
	Model 1	Model 2	Model 3	Model 4
1. Gender	.059 (.21)	-.048 (.14)	-.114 (.13)	-.139 (.13)
2. Country	.147 (.22)	.027 (.15)	-.039 (.15)	.017 (.15)
3. Age	-.201 (.15)	-.293** (.10)	-.225* (.09)	-.226* (.09)
4. Education	-.049 (.12)	.069 (.08)	.127 (.08)	.111 (.08)
5. Tenure	-.033 (.09)	.035 (.06)	-.060 (.06)	-.076 (.06)
6. Team Size	.059 (.07)	.028 (.04)	.048 (.04)	.049 (.04)
7. Collective Efficacy		.134 (.07)	.042 (.07)	-.053 (.08)
8. Team Proactive personality		.417*** (.09)	.382*** (.08)	.392*** (.08)
9. Supportive Supervision		.269*** (.08)	.212**(.08)	.134 (.09)
10. Collective Efficacy x_ Proactive personality			-.025 (.08)	-.058 (.08)
11. Collective Efficacy x Supportive Supervision			-.256*** (.07)	-.147 (.09)
12. Proactive personality x Supportive Supervision			.143 (.08)	.128 (.08)
13. Collective Efficacy x Proactive personality x Supportive Supervision				.093* (.05)

Note: Level-1 n = 185, level-2 n = 64, values are standardized coefficients, with standard errors in parentheses. Team innovation is the dependent variable.

*correlation is significant at the $p < 0.05$ level, **correlation is significant at the $p < 0.01$ level and ***correlation is significant at the $p < 0.001$.

The slopes for the two low proactive personality groups (Group 3-high supportive supervision, and Group 4-low supportive supervision) were significantly different from each other (t = - 3.577, p = .000), suggesting that high levels of supportive supervision in combination with low levels of proactive personality result in higher levels of team innovation in the case of low collective efficacy, but produce lower levels of team innovation in the case of high levels of collective efficacy. The slope for high proactive personality and low proactive personality (Group 1-high supportive supervision, and Group 4-low supportive supervision) were significantly different from each other (t = - 2.649, p < .009), suggesting that high levels of supportive supervision in combination with high levels of proactive personality result in highest levels of team innovation in both levels of collective efficacy, but (as opposed to Group 4) produce a negative line of the relationship, suggesting that low levels of collective efficacy are more suited for fostering team innovation in the case of high supportive supervision and high proactive personality.

Figure 7: The moderating role of individuals' perception of team proactivity and supportive supervision on relationship between collective efficacy and team innovation at −1 SD (low) and +1 SD (high) of the centered means.



4.5 Discussion

By drawing upon the theoretical perspectives of personalities and beliefs (Bandura, 1997; Chen et al., 2013; Williams et al., 2010), team-level emergent states (Marks et al., 2001), and multi-level theory (Chen et al., 2005; Kozlowski & Klein, 2000), I investigated how individual-level elements (aggregated to team level), as well as their interplay, influence team innovation. My findings largely validated the hypothesis that relationship between individuals' perceptions of collective efficacy and team innovation is moderated by proactive personality and supportive supervision.

In line with my hypothesis, I found support for a three-way interaction of individuals' perceptions of collective efficacy, team proactivity and supportive supervision in relation to team innovation. The form of interaction demonstrates that in situations with high supportive supervision, proactive personality results in highest levels of team innovation in both levels of collective efficacy, but produce a negative line of the relationship, suggesting that low levels of collective efficacy are more suited for fostering team innovation in the case of high supportive supervision and high proactivity.

4.5.1 Contributions and theoretical implications

This paper establishes the basis and outlines a multi-level approach for researching team idea generation process. I propose that such method offers a more complete interpretation of the interplay between the individual and the team in understanding the innovation processes. The overarching advantage of multi-level approach over single-level approach includes the ability to study the interaction of individuals' perception of collective efficacy (motivation) over proactivity (ability) and supportive supervision (opportunity) to achieve higher levels of team innovation (outcome).

I contribute to the literature in three ways. First, most generally, by building upon the AMO framework and adopting a micro-meso perspective that incorporates models of individual beliefs,

personalities, support, and team innovation, I contribute to the intersection of the literature on organizational behavior and innovation management by elaborating the importance of the AMO framework at the team-level innovation management, which posits that a team's actions (and not just an individual's) are driven by all three elements.

With AMO model we show that team innovation is the function of team members' ability, motivation and opportunity. Members will perform great when they are capable of doing so (as they have the required know-how and skills for the completion of task), they have the motivation to do it (they will complete the task due to the fact that they want to) and lastly, there will be improved performance if their business environment provides the needed support (e.g. through empowerment).

Therefore, team innovation may be understood as a result of all three of them: motivation (efficacy beliefs), which captures the force that pushes people toward certain goals; ability (proactivity) represents team's ability to encourage change and participate in influencing the environment and opportunity (supportive supervision), which represents the environmental or contextual mechanisms that enable action by creating opportunities for performance, and enhancing employees' belief in their conjoint capabilities, which can lead to improved outcomes.

My second contribution is to the AMO literature by using the AMO model on group level. The AMO model on team level helps to answer question like: What do teams experience being capable of?, What motivates them, and which tasks specifically do they find meaning in?, Which opportunities do they experience having? Even though AMO model proposes that all three variables are necessary for outcome achievement, the results indicate that when team is offered an opportunity (supportive supervision) and possesses abilities (proactivity) the level of motivation (collective efficacy) is not as necessary as when the team lacks in abilities and opportunities. One explanation for this may be that when teams do not receive enough support and members are not proactive, the joint belief in their capabilities becomes a necessity for achieving higher levels of team innovation. After all, supervisor's support may be particularly important when combined with high proactive personality, which implies "a favorable" working environment, in which employees' motivation is not as necessary.

Finally, my third contribution is the use of emergent constructs at the individual level to achieve the outcome on team level. Morgeson and Hofmann (1999) suggested that emergent constructs (e.g. group personality) may originate from different sources but maintain similar meanings to their lower-level constructs. All three aggregate-level measures used in the study were aggregated to team level as the emergent constructs, and they all showed sufficient inter-member agreement, which justified the aggregation of ratings within units to the unit level (Chen et al., 2005). By detecting relatively high and significant ICC(1) results for these measures further indicate that variability is smaller within teams than between teams.

4.5.2 Practical implications

This study has also an important managerial implication. There is an agreement that a key organizational competitive advantage lies in its ability to adapt to challenges from business environment. My study highlights the significance of addressing both individual and team contributions when dealing with team-level idea generation. Explicitly, the study suggests that team innovation is influenced by team characteristics and/or processes, individual personalities, and beliefs.

I argue that the AMO framework represents a further mechanism linking leadership practices and team innovation. For example, when levels of motivation are low, it is extremely important that teams are proactive and leaders provide support in order to achieve high levels of team innovation. Leaders can influence employees' motivation (efficacy beliefs) by communicating a high level of confidence in the team's ability to achieve ambitious collective goals and their confidence can have a contagious effect on members' own confidence (Podsakoff, MacKenzie, Moorman, & Fetter, 1990).

Leaders also influence employees' abilities (proactive personality) by providing supportive environment for promotion of change and taking action to influence the environment and finally, leaders influence opportunities (supportive supervision), by showing concern for members' needs, which promotes a belief among team members that the leader will provide them with any

support that they might need and strengthen team members' confidence in their conjoint capabilities (Schaubroeck, Lam, & Cha, 2007), which leads to improved outcomes.

The theoretical model I outline can help inform organizations and managers how to effectively recruit and train individual team members and teams as a whole in order to achieve higher levels of team innovation. According to my results, the level of collective efficacy had less effect on team innovation if teams perceived higher levels of supportive supervision and proactive personality. If teams had lower levels of motivation (individual perception of collective capabilities), ability (through proactive personality) and provided opportunity (supportive supervision) were more important for achieving higher levels of team innovation as they were when teams perceived lower levels of motivation. Therefore, increased attention needs to be paid to employees by recruiting innovative individuals and providing supportive environment where employees are motivated, able to seek continuous improvement, and search for innovative solutions to problems.

To achieve this, leaders should adopt transformational management style, the ability to get teams to want to change and increase the level of their proactive personality, which may function as the safety net for teams to think and behave innovatively. When teams achieve high levels of proactive personality, leaders give them more freedom to act on their terms and so they can create an environment with less regulations and policies from company's side. Leaders can rely on “Deep Dive” process (Kelley, Littman, & Peters, 2001), which is a technique to rapidly engage a team into a situation for idea generation and is widely used for innovation in idea generation phase and product development or improvement.

4.5.3 Limitations and future research directions

While the above findings make several significant contributions, it is imperative to point out also some of the limitations and debate how they could encourage future research. One of the biggest limitation of my study are the cross-sectional data as they were collected by studying individuals and teams at the same point of time without regard to differences in time and I have non-

experimental data therefore I can not make casual claims (Antonakis et al., 2010). Furthermore, although I have empirically tested and cited several studies that support hypotheses in the model throughout the paper, the results should be viewed with caution in light of the smaller sample size. Therefore, feasibility of the model and its ability to complement and extend existing theories should be tested in a large-scale study also in countries outside Europe. It is important to now go further; as such research would additionally extend our knowledge about the innovative process.

While I was able to explain that the team- and individual- inputs studied here (i.e., efficacy beliefs, proactive personality and supportive supervision) have an important impact on team innovation, I recognize that other antecedents, which I did not include in the study could also account for innovative performance at team level. For example, I did not assess other personal characteristics (e.g. intuition, need for cognition) and team-level factors that might affect this relationship (e.g. team-level leader-members exchange, influence tactics, psychological safety). Therefore, additional studies are needed to build on my model of multi-level teams innovation processes, and take into account further antecedents that encourage innovation across different levels of analysis.

4.6 Conclusion

Despite these limitations, there are important aspects in the present study for researchers as well as practitioners working in the field of innovation. I applied a multi-level approach as I wanted take preliminary steps in improving and developing a more comprehensive view of team innovation that comprised emergent influences of individual members on their teams.Efficacy beliefs were associated with team innovative behavior by influencing employees' motivation to engage in such behaviors, as they capture confidence to generate and implement new ideas.

I took this analysis a step further by taking into account how this relationship might be moderated by proactive personality and supportive supervision as they encourage team members to take initiative and to focus on exploratory thinking and so it enables a working environment

where risk-taking approaches are valued and innovation is given a high priority. My findings are consistent with the idea that efficacy beliefs stimulate team innovation and the level of collective efficacy had less effect on team innovation if teams perceived higher levels of supportive supervision and proactive personality. I hope this work will encourage future multi-level studies associated to individual personalities and team innovation.

CHAPTER 5: GENERAL DISCUSSION AND CONCLUSION

5.1 Summary of findings and contributions

Overall, the red line of my PhD dissertation deals with micro-foundations and their influence on team innovation by applying fundamental principles of multi-level theory and research organized around what, how, where, and why of multi-level theoretical models.

In my thesis, I was structuring a theory and applying research that attempts to understand micro-foundations and their effect on team innovation. I wished to clarify which micro-foundations are important for achieving team innovation success in general, as well as by showing how they can promote or inhibit different phases of team innovation. At different levels of analysis, I provided distinct definitions of micro-foundations and showed whether (and to what extent) they are isomorphic.

In terms of intuition, this construct at different levels is not isomorphic as it has a lot of configural properties, i.e. functionally equivalent but different or discontinuous across levels (Chen et al., 2005). Perceptions of team intuition are not assumed to conjoin among the group members. Individual contributions to configural unit properties are clearly not the same and hence configural unit properties have to seize the selection of these distinctive contributions to the whole (Kozlowski & Klein, 2000).

Perception of team intuition originates at the individual level but development of team intuition involves drawing advice and experience from colleagues and making the individuals' tacit knowledge more available to the team. In addition, daily task interactions also help team members to develop shared domain-related experiences. Therefore, team intuition becomes homogenous within the members due to regular contacts and individuals working in the team are likely to be a part of the same process, share experiences, and collect similar information (Hinsz et al., 1997). I propose that team intuition emerges as a shared referent-shift construct (Chan, 1998; Chen et al., 2005) and can be measured using aggregated responses from team members.

Similar is true for NFC, where there is no prerequisite for sharedness of experience or consensus, nor any required interdependence. Therefore, my main assumption is that the meaning of team NFC is an average of the individuals' NFC regardless of the variance among these units, as it has no theoretical or operational concern for composing the individuals' NFC to the team's NFC. Team NFC can be conceptualized by using summary index model (Chen et al., 2005), in which the team-level construct is defined as the mean of the individual characteristics.

In regards to psychological safety this construct has some global properties – it denotes the team climate described by interpersonal trust and shared respect in which people are at ease being who they are. This can apply for individual or group level. However, psychological safety needs to define the whole team rather than individuals within the team, and members should embrace similar opinions of it in order to be a group-level construct. Perceptions of psychological safety should converge within a team, as members are exposed to the same set of organizational effects and because these perceptions develop out of mutual experiences. I therefore propose that team psychological safety emerges as a shared referent-shift construct (Chan, 1998; Chen et al., 2005).

Collective efficacy discusses individual members' perceptions of their team's competency (Bandura, 1986) or aggregated capability to effectively complete a chosen task (Guzzo et al., 1993). Individuals working together in the team are expected to be a part of the same process and collect similar information (Hinsz et al., 1997). As result, all members probably concentrate on similar information when assessing their collective efficacy leading to emergence of collective efficacy as a shared referent-shift construct (Chan, 1998; Chen et al., 2005), where the referent of collective efficacy shifts from individual to team level. In referent-shift consensus composition, the lower level characteristics that are being assessed for consensus are conceptually different although they originate from individual-level construct (Chan, 1998).

Team proactivity is not the same as the sum of individual proactive team members but is collective in emphasis. Proactive team members put forward ideas on work improvement and suggestions how to avoid problems. This construct has some global properties and can apply for individual or group levels. I thus propose that team proactivity emerges as a consensus construct

(Chan, 1998; Chen et al., 2005; Williams et al., 2010), as it maintains the same meanings across different levels of analysis, and it uses an individual as the construct's referent.

If team members hold similar perceptions of supportive supervision, it is operationalized as a group-level construct. I hence propose that supportive supervision emerges as a shared referent-shift construct that maintains the same meanings across different levels of analysis but it uses the aggregate – not the individual – as the construct's referent (Chan, 1998; Chen et al., 2005).

I aimed to contribute to the clarification of the field and to provide a basis for empirical research in terms of multi-level foundations of personalities that could foster team innovation, with a qualitative review in Chapter 1. Following this examination, I focused on the quantitative research and examined these antecedents and their influence on team innovation. In this next and final step, I attempted to bridge the gap and provide further insight at lower levels by examining the micro foundations of team innovation. I demonstrated that it is important to differentiate between two phases of the innovation process (i.e. idea generation and idea implementation).

I followed the principle of Kozlowski and Klein (2000) that suggests that unit specification at different levels should be driven by the theory of the phenomena in question. In my dissertation, I mostly focused on bottom-up processes so I focused on providing a comprehensive examination of bottom-up emergence processes for the most part. I have discussed bottom-up processes when dealing with micro-level foundations (personality), as well as in providing more or less analogous (homologous; i.e. similar across the levels of research) relationships at different levels of analysis. Bottom-up emergent effects require long-term designs (Kozlowski & Klein, 2000), which was beyond the scope of this dissertation.

In each chapter, I provided a detailed explanation of the assumptions constraining processes that I examined. I applied a multi-level approach because team innovation and their foundations are influenced by factors from different levels, and reflect actions or cognitions of lower-level organizational units (Kozlowski & Klein, 2000).

5.2 Overarching theoretical and methodological contributions

One of the most important contributions of my dissertation to team innovation literature is to demonstrate how do different micro-level antecedents influence team innovations. The thesis sets out the fundamentals and frames a multi-level approach for studying team innovation process. Such approach provides a more complete interpretation of the interplay between the individual and the team in understanding the innovation processes. The thesis provides further empirical evidences to personality and innovation literature and insights regarding how to foster team innovative behavior. I do so in several steps; In Chapter 1, I first provide overview of existing literature on personalities.

Most importantly, I identify the following antecedents of team innovation: individual's perceptions of team intuition (Dayan & Di Benedetto, 2011), need for cognition (Cacioppo et al., 1996), psychological safety (Edmondson, 1999), collective-efficacy (Riggs et al., 1994), proactive personality (Bateman & Crant, 1993), supportive supervision (Manz & Sims, 1987), and empirically examine them in Chapters 2–4 at individual and team level of research. All findings empirically support theoretical foundations from Chapter 1 that argue for the importance of these components, as identified in the literature review.

Second overarching contribution of my dissertation is to extend prior work on the development of multi-level theory and research of team innovation field. A multi-level approach, which combines micro and meso standpoints, generates a more integrated knowledge (Kozlowski & Klein, 2000) of team innovation. By focusing on phenomena of team innovation and its predictors, I contribute to building a science of team innovation in organizations that is rich in theory and relevant for practice. The biggest advantage of such theory building is for organizational scholars that are taught to reason within one level - individual or team, but not multi-level - individual and team (Kozlowski & Klein, 2000).

I further contribute to multi-level literature with the use of emergent constructs at the individual level to achieve the outcome on team level. Morgeson and Hofmann (1999) suggested that emergent constructs (e.g. group personality) may originate from different sources but maintain

similar meanings to their lower-level constructs. Emergent phenomena that manifest from psychological characteristics and interactions among individuals are a fundamental dynamic process in multi-level theory. All aggregate-level measures used in the study were aggregated to team level as the emergent constructs, and they all showed sufficient inter-member agreement, which justified the aggregation of ratings within units to the unit level (Chen et al., 2005). Detecting relatively high and significant ICC(1) results for these measures further indicates that variability is smaller within teams than between teams.

As mentioned, team intuition, team psychological safety, collective efficacy and supportive supervision emerge as a shared referent-shift construct (Chan, 1998; Chen et al., 2005) and can be measured using aggregated responses from team members. Team NFC can be conceptualized by using summary index model (Chen et al., 2005), in which the team-level construct is defined as the mean of the individual characteristics and team proactivity emerges as a consensus construct (Chan, 1998; Chen et al., 2005; Williams et al., 2010), as it maintains the same meanings across different levels of analysis, and it uses an individual as the construct's referent. With the thesis' models I showed which micro-foundations (between intuition, need for cognition (NFC), efficacy beliefs, proactivity and psychological safety) are the most important in specific context for team innovation success.

Third theoretical contribution of my dissertation as a whole is to bridge the disciplinary gap between organizational behavior, psychology and innovation management. This is apparent in all chapters at the individual and team level, where I bring together the separated research streams of personalities and innovation to contribute to an investigation of their relationship. I bridge this gap by relying on Cognitive-experiential self-theory from psychology field in Chapter 2 and 3 whereas in Chapter 4 I focus on the ability–motivation–opportunity framework for behavior research in order to explain the outcome of team innovation from management perspective.

In addition to emergence of individual level construct to team level construct, evidence suggests that contextual factors that influence personality play an important role in team innovation success. Team members tend to follow their leaders and often impersonate their approaches and behaviors. By providing support and removing stumbling blocks they can escalate innovation

success. The thesis results show that supervisor's support may be particularly important when combined with high proactive personality, which implies "a favorable" working environment.

Another contribution of my dissertation is related to its scope. Accordingly to Rousseau (1985) I follow the multi-level research framework and describe the levels of theory, measurement, and analysis in all chapters of my dissertation. This enables a more accurate assessment of studied constructs without making common fallacies at different levels of analysis. I provide definitions of the examined constructs at both levels and consciously study them separately at different levels in order not to make any theoretical errors.

To account for the appropriate levels of measurement and analysis, I used existing survey scales that do not contain items with mixed-level item referents, which would undermine their construct validity (Mathieu & Chen, 2011). I examine personal (e.g. intuition, psychological safety) factors at the individual level, as well as investigate these factors at team level. By adopting a multi-level perspective I try to apply micro and meso innovation research.

I examine the relationships using an appropriate analytic approach that accounts for dependence among lower-level units, their nesting, and emergence (Mathieu & Chen, 2011). Furthermore, I computed rwg-based estimates for determining interrater (within-team) agreement and complementary interrater reliability estimates based on ANOVA (Bliese, 2000). Namely, multivariate hierarchical regression analysis offers ways to test different aspects of multi-level models. It is a variant of the basic multiple regression procedure that allows you to specify a fixed order of entry for variables in order to control for the effects of covariates or to test the effects of certain predictors independent of the influence of others. Therefore, another contribution of my dissertation is in the rigorous empirical research. The use of primary data and hierarchical regression analysis, moderation analysis, agreement, validity, and reliability analysis at individual and team level of analysis provides an empirical contribution that adds to the validity of my inferences.

5.3 Practical implications

In each chapter, I point out specific practical implications, which are tangible and relevant to managers because of their clearness. However, this dissertation also offers some overarching managerial implications. I mainly provide clarification of the team-level content of innovation. Managers are often faced with the question: Why is innovation so hard to implement?

They are frequently unaware of what exactly they need to do in order to achieve successful team innovation. One of the reasons is that many of them don't understand the different personalities that are necessary to create and operate an innovative and booming business. Managers need to encourage their team members to share their perspectives with each other, building teamwork and helping to catalyze innovation within a team, department or organization. Overall, team members' personality features are typical models of thinking, feeling, and acting that will affect team innovation through different processes varying from how members plan to complete the task to how they cooperate. In my thesis I focus on intuition, need for cognition, perception of psychological safety, efficacy beliefs and proactive personality. The dissertation helps in addressing this concern as it provides a better idea of team innovation.

Another practical implication is that I describe both contextual cues that are important for the process of team innovation and its micro-level foundations. This gives managers an idea how to adopt team innovation, what exactly it constitutes, and to which results it may lead if carried out accurately. My thesis provides managers with knowledge about what might happen if they intervene for example by demonstrating high levels of supervisory support, employing people with certain personalities, or providing environment on which employees feel safe.

5.4 Limitations and future research suggestions

Although the thesis makes several noteworthy contributions, it is important to point out also some of the limitations. One limitation of this dissertation are the cross-sectional data as they were collected by studying individuals and teams at the same point of time without regard to

differences in time and I have non-experimental data therefore I can not make casual claims (Antonakis et al., 2010).

Although I have empirically tested and cited several studies that support my hypotheses, the results should be viewed with caution in light of the smaller sample size. Therefore, feasibility of the models and their ability to complement and extend existing theories should be tested in a large-scale study also in countries outside central Europe. To accurately test a multi-level model of all interrelationships a sample of multiple companies and their employees nested in teams from countries from all over the world is needed. This would represent a broad research program that is beyond the scope of my thesis.

While I was able to explain that the team- and individual- inputs studied here (i.e., intuition, NFC, psychological safety, efficacy beliefs, proactive personality and supportive supervision) have an important impact on team innovation, I acknowledge that other factors, which I did not take into consideration could also explain team innovative performance. For example, I did not assess other personal characteristics (e.g. agreeableness, conscientiousness) and team-level factors that might affect this relationship (e.g. team-level leader-members exchange, influence tactics). Therefore, additional studies are needed to build on my model of multi-level teams innovation processes, and take into account further antecedents that encourage innovation across different levels of analysis. My dissertation belongs primarily to the scientific area of the organization behavioral studies, which is why I did not focus on topics related to technological innovation of a more industrial economics nature.

5.5 Conclusion

This dissertation demonstrates the importance of referring to multi-level theory for team innovation research and taking a multi-level perspective to examine its content, context, and predictors. No single-level viewpoint can sufficiently explain organizational behavior that underlies team innovation. The macro perspective disregards the means by which the individual behavior and opinions give rise to higher-level team innovation.

I provide in Chapter 1 a theoretical overview of the antecedents of team innovation that has previously been lacking. This chapter serves as a literature review that deals with the micro-level antecedents of team innovation. In chapter 2 I compared the effects of rational versus intuitive problem solving on different phases of team innovation. I found that team intuition more strongly relates to team idea generation whereas individuals' perceptions of team NFC more strongly relate to team idea implementation.

In chapter 3 I examine more closely the relationship between team intuition and team idea generation. The results of the study revealed that intuition is positively and significantly related to idea generation. Furthermore, the highest levels of idea generation in teams were achieved when perceived levels of team intuition were high. What is more, teams perceived high levels of NFC and psychological safety. Results from chapter 4 showed that collective efficacy was positively related to team innovation. However, the effect of collective efficacy on team innovation was weaker when high levels of supportive supervision and proactivity moderated this relationship. When teams perceived lower levels of collective efficacy, team proactivity, and supportive supervision were more important for achieving higher levels of team innovation as they were when teams perceived lower levels of motivation.

The research contributes to the intersection of the literatures on organizational behavior and innovation management by elaborating the importance of the CEST theory and AMO framework at the team-level innovation management. My second contribution is to the CEST and AMO literature by applying them at team level. Finally, my third contribution is the use of emergent constructs at the individual level to achieve the outcome on team level.

On the basis of my research, it is safe to say that future theoretical or empirical models of team innovation should benefit from adopting a multi-level perspective. This approach bridges the gap in different disciplines, and implements insights and advancements from diverse aspects. From a practical perspective, managers and organizations should benefit from a more precise understanding of both individual and contextual influences in constructing work environments that could ultimately foster innovation at team levels.

REFERENCES

1. Agor, W. H. (1989). *Intuition in Organizations: Leading and Managing Productively*. Newbury Park, CA: Sage Publications.

2. Agrell, A., & Gustafson, R. (1996). Innovation and creativity in work groups. In M. A. West (Ed.), *Handbook of work group psychology* (pp. 314-343). London Wiley.

3. Akinci, C., & Sadler-Smith, E. (2012). Intuition in Management Research: A Historical Review. *International Journal of Management Reviews, 14*, 104–122.

4. Allison, C. W., & Hayes, J. (1996). The cognitive style index: a measure of intuitive-analysis for organizational research. *Journal of Management Studies, 33*, 119–135.

5. Amabile, T. M. (1983). *The Social Psychology of Creativity*. New York: Springer-Verlag.

6. Amabile, T. M. (1988). A model of creativity and innovation in organizations. *Research in Organizational Behavior, 10*, 123-167.

7. Amabile, T. M. (1993). Motivational synergy: Toward new conceptualizations of intrinsic: and extrinsic motivation in the workplace. *Human Resource Management Review, 3*, 185- 201. doi: 10.1016/1053-4822(93)90012-S

8. Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview Press.

9. Amabile, T. M. (2000). Stimulate creativity by fuelling passion. In E. Locke (Ed.), *Handbook of principles of organizational behavior* (pp. 331-341). Malden, MA: Blackwell.

10. Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154-1184.

11. Ancona, D. G., & Caldwell, D. F. (1987). Management issues facing new product teams in high technology companies. In D. Lewin, D. Lipsky & D. Sokel (Eds.), *Advances in industrial and labor relations* (Vol. 4, pp. 191-221). Greenwich, CT: JAI Press.

12. Ancona, D. G., & Caldwell, D. F. (1992). Demography and design: Predictors of new product team performance. *Organization Science, 3*, 321–341.

13. Anderson, N., & King, N. (1991). Managing innovation in organizations. *Leadership & Organisation Development Journal, 12*, 17–21. doi: 10.1108/01437739110143024

14. Anderson, N., & King, N. (1993). Innovation in organizations. In C. L. Cooper & I. T. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 1-34). Chichester, England: Wiley.

15. Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and Creativity in Organizations: A State-of-the-Science Review, Prospective Commentary, and Guiding Framework. *Journal of Management, 40*(5), 1297-1333. doi: 10.1177/0149206314527128

16. Anderson, N., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the Team Climate Inventory. *Journal of Organizational Behavior, 19*, 235-258. doi: 10.1002/(SICI)1099-1379(199805)19:3<235::AID-JOB837>3.0.CO;2-C

17. Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *The Leadership Quarterly, 21*(6), 1086–1120. doi: 10.1016/j.leaqua.2010.10.010

18. Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. L. (2000). *Manufacturing advantage: Why high-performance work systems pay off*. London: Economic Policy Institute: Cornell University Press.

19. Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestion and implementation of ideas. *Journal of Occupational and Organizational Psychology, 73*, 265-285. doi: 10.1348/096317900167029

20. Baer, M. (2012). Putting Creativity to Work: The Implementation of Creative Ideas in Organizations. *Academy of Management Journal, 55*(5), 1102-1150.

21. Baer, M., & Frese, M. (2003). Innovation is not enough: climates for initiative and psychological safety, process innovations, and firm performance. *Journal of Organizational Behavior, 24*, 45–68.

22. Bal, P. M., Chiaburu, D. S., & Diaz, I. (2011). Does psychological contract breach decrease proactive behaviors? The moderating effect of emotion regulation. *Group & Organization Management, 36*(6), 722-758. doi: 10.1177/1059601111423532

23. Ballantine, K., & Nunns, C. G. (1998). The moderating effect of supervisory support on the self-efficacy work-performance relationship. *South African Journal of Psychology, 28*(3), 164-173. doi: 10.1177/008124639802800307

24. Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

25. Bandura, A. (1990). Reflections on nonability determinants of competence. In R. J. Sternberg & J. J. Kolligian (Eds.), *Competence considered* (pp. 315-362). New Haven, CT: Yale University Press.

26. Bandura, A. (1997). *Self-efficacy: The exercise of control.* . New York: Freeman.

27. Bandura, A. (2000). Exercise of human agency through collective efficacy. *Current Directions in Psychological Science, 9*(1). doi: 10.1111/1467-8721.00064

28. Barron, F., & Harrington, D. M. (1981). Creativity, intelligence and personality. *Annual Review of Psychology, 32*, 439–476.

29. Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior, 14*(2), 103-118. doi: 10.2307/2488028

30. Berlyne, D. E. (1960). *Conflict, arousal, and curiosity*. New York: McGraw-Hill.

31. Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. (2009). A dialectic perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 2*(3), 305-337. doi: 10.1111/j.1754-9434.2009.01154.x

32. Bliese, P. D. (2000). Within group agreement, non-independence and reliability: Implications for data and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research and methods in organizations: Foundations, extensions, and new directions* (pp. 349-381). San Francisco: Jossey-Bass.

33. Blumberg, M., & Pringle, C. D. (1982). The missing opportunity in organizational research: Some implications for a theory of work performance. *Academy of Management Review, 7*(4), 560-569.

34. Boxall, P. & Purcell, J. (2003). *Strategy and Human Resource Management*. Basingstoke, Palgrave MacMillan.

35. Brislin, R. W. (1986). The wording and translation of research instruments. In W. L. Lonner & J. W. Berry (Eds.), *Field Methods in Cross-Cultural Research*. Newbury Park, CA: Sage.

36. Brown, S., & Eisenhardt, K. M. (1995). Product development: past research, present findings and future directions. *Academy of Management Review, 20*(2), 343-379.

37. Burke, L. A., & Miller, M. K. (1999). Taking the mystery out of intuitive decision-making. *Academy of Management Executive, 13*, 91–99.

38. Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42*, 116-131.

39. Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin, 119*, 197-253.

40. Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*, 306-307.

41. Cacioppo, J. T., Petty, R. E., Kao, C. F., & Rodriguez, R. (1986). Central and peripheral routes to persuasion: An individual difference perspective. *Journal of Personality and Social Psychology, 51*, 1032-1043.

42. Cacioppo, J. T., Petty, R. E., & Morris, K. (1983). Effects of need for cognition on message evaluation, recall, and persuasion. *Journal of Personality and Social Psychology, 45*, 805-818.

43. Camiso´n-Zornoza, C., Lapiedra-Alcamı´, R., Segarra-Cipre´s, M., & Boronat-Navarro, M. (2004). A meta-analysis of innovation and organization size. *Organization Studies, 25*, 331–361.

44. Černe, M., Jaklič, M., & Škerlavaj, M. (2013a). Authentic leadership, creativity, and innovation: A multilevel perspective. *Leadership, 9*(1), 63-85.

45. Černe, M., Jaklič, M., & Škerlavaj, M. (2013b). Decoupling management and technological innovations: Resolving the individualism–collectivism controversy. *Journal of International Management, 19*(2), 103–117. doi: 10.1016/j.intman.2013.03.004

46. Černe, M., Jaklič, M., Škerlavaj, M., Ülgen Aydinlik, A., & Donmez Polat, D. (2012). Organizational learning culture and innovativeness in Turkish firms. *Journal of management & organization* 18(2), 193-219.

47. Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of comparison models. *Journal of Applied Psychology, 83*, 234–246. doi: 10.1037/0021-9010.83.2.234

48. Chen, G., & Bliese, P. D. (2002). The role of different levels of leadership in predicting self- and collective efficacy: evidence for discontinuity. *Journal of Applied Psychology, 87*(3), 549–556. doi: 10.1037/0021-9010.87.3.549

49. Chen, G., Farh, J. L., Campbell-Bush, E. M., Wu, Z., & Wu, X. (2013). Teams as innovative systems: Multilevel motivational processes as drivers of innovation. *Journal of Applied Psychology, 2013*. doi: 10.1037/a0032663

50. Chen, G., & Kanfer, R. (2006). Toward a systems theory of motivated behavior in work teams. *Research in Organizational Behavior, 27*, 223–267.

51. Chen, G., Mathieu, J. E., & Bliese, P. D. (2005). A framework for conducting multi-level construct validation. In F. J. Yammarino & F. Dansereau (Eds.), *Multilevel Issues in Organizational Behaviour and Process* (pp. 273 – 303). Amsterdam: Elsevier.

52. Chen, G., Webber, S. S., Bliese, P. D., Mathieu, J. E., Payne, S. C., Born, D. H., & Zaccaro, S. J. (2002). Simultaneous examination of the antecedents and consequences of efficacy beliefs at multiple levels of analysis. *Human Performance, 15*(4), 381-409. doi: 10.1207/S15327043HUP1504_05

53. Chi, N.-W., Huang, Y.-M., & Lin, S.-C. (2009). A double-edged sword? Exploring the curvilinear relationship between organizational tenure diversity and team innovation: The moderating role of team-oriented HR practices. *Group & Organization Management, 34*(6), 698-726. doi: 10.1177/1059601109350985

54. Choi, J. N., & Chang, J. Y. (2009). Innovation implementation in the public sector: An integration of institutional and collective dynamics. *Journal of Applied Psychology, 94*(1), 245-253.

55. Collings, D. G. C., & Mellahi, K. (2009). Strategic talent management: A review and research agenda. *Human Resource Management Review, 19*(4), 304–313. doi: 10.1016/j.hrmr.2009.04.001

56. Contino, D. S. (2004). Leadership competencies: Knowledge, skills, and aptitudes nurses need to lead organizations effectively. *Critical Care Nurse, 24*(3), 52-64.

57. Costa, P. L., Graça, A. M., Marques-Quinteiro, P., Santos, C. M., Caetano, A., & Passos, A. M. (2013). *Multilevel Research in the Field of Organizational Behavior* (Vol. 3).

58. Crant, J. M. (2000). Proactive behaviour in organizations. *Journal of Management, 26*, 435–462. doi: 10.1177/014920630002600304

59. Crossan, M. M., & Apaydin, M. (2010). A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature. *Journal of Management Studies, 47*(6), 1154-1191.

60. Da Silvaa, N., & Oldhamb, G. R. (2012). Adopting Employees' Ideas: Moderators of the Idea Generation–Idea Implementation *Creativity Research Journal, 24*(2-3), 134-145. doi: 10.1080/10400419.2012.677257

61. Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal, 34*, 555–590.

62. Damasio, A. (1994). *Descartes' error: emotions, reason, and the human brain*. New York: Avon Books.

63. Dane, E., Baer, M., Pratt, M. G., & Oldham, G. R. (2011). Rational versus intuitive problem solving: How thinking "off the beaten path" can stimulate creativity. *Psychology of Aesthetics, Creativity, and the Arts, 5*(1), 3–12. doi: 10.1037/a0017698

64. Dane, E., & Pratt, M. G. (2007). Exploring Intuition and Its Role in Managerial Decision Making. *The Academy of Management Review, 32*(1), 33-54. doi: 10.5465/AMR.2007.23463682

65. Dane, E., Rockmann, K., & Pratt, M. G. (2005). *Should I trust my gut? The role of task characteristics in intuitive and analytical decision-making*. Paper presented at the 2005 Academy of Management Meeting, Honolulu, HI.

66. Dayan, M., & Di Benedetto, A. C. (2011). Team intuition as a continuum construct and new product creativity: the role of environmental turbulence, team experience, and stress. *Research Policy, 40*(2), 276-286. doi: 10.1016/j.respol.2010.10.002

67. Dayan, M., & Elbanna, S. (2011). Antecedents of Team Intuition and Its Impact on the Success of New Product Development Projects. *Journal of Product Innovation Management, 28*, 159–174.

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

69. De Leeuw, J., & Kreft, G. G. (1986). Random Coefficient Models for Multilevel Analysis. *Journal of Educational Statistics, 11*(1), 57-85.

70. Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology, 53*(6), 1024-1037.

71. Dollinger, S. J. (2003). Need for uniqueness, need for cognition, and creativity. *Journal of Creative Behavior, 37*, 99-116.

72. Drach-Zahavy, A., & Somech, A. (2001). Understanding team innovation: The role of team processes and structures. *Group Dynamics: Theory, Research, and Practice, 5*(2), 111-123.

73. Du Toit, S. H. C., & Du Toit, M. (2007). Multilevel Structural Equation Modeling. In The analysis of multilevel models. In J. D. Leeuw & E. Meijer (Eds.), *Handbook of multilevel analysis*. New York, NY: Springer-Verlag.

74. Dutton, J. (1993). The making of organizational opportunities: An interpretive pathway to organizational change. In L. L. Cummings & B. M. Staw (Eds.), *Research in Organizational Behavior,* (Vol. 15, pp. 195-226). Greenwich, CT: JAI Press.

75. Eden, D. (1992). Female engineers: Their career socialization into a male-dominated occupation. *Urban Education, 27,* 174-195. doi: 10.1177/0042085992027002005

76. Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly, 44*(2), 350-383.

77. Eisenbeiss, S. A., van Knippenberg, D., & Boerner, S. (2008). Transformational leadership and team innovation: Integrating team climate principles. *Journal of Applied Psychology, 93*(6), 1438-1446. doi: 10.1037/a0012716

78. Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology, 71*(3), 500-507. doi: 10.1037/0021-9010.71.3.500

79. Eisenhardt, K. M. (1999). Strategy as strategic decision making. *Sloan Management Review, 40*, 65–72.

80. Eisenhardt, K. M., & Tabrizi, B. N. (1995). Accelerating adaptive processes: Product innovation in the global computer industry. *Administrative Science Quarterly, 40*(1995), 84-111.

81. Elbanna, S., & Child, J. (2007). Influences on strategic decision effectiveness: development and test of an integrative model. *Strategic Management Journal, 28*(4), 431–453.

82. Epstein, S. (1990). Cognitive-experiential self-theory. In L. Pervin (Ed.), *Handbook of personality theory and research* (pp. 165-192). New York: Guilford Press.

83. Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist, 49,* 709-724.

84. Epstein, S. (2003). *Cognitive-Experiential Self-Theory of Personality*.

85. Epstein, S. (2008). Intuition From the Perspective of Cognitive-Experiential Self-Theory. In T. Betsch (Ed.), *Intuition in Judgment and Decision Making* (pp. 23-38). Oxford, UK: Psychology Press.

86. Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive-experiential and analytical-rational thinking styles. *Journal of Personality and Social Psychology, 71*, 390–405.

87. Ettlie, J. E. (1983). Organizational policy and innovation among suppliers to the food processing sector. *Academy of Management Journal, 26*, 27-44. doi: 10.2307/256133

88. Evans, C. J., Kirby, J. R., & Fabrigar, L. R. (2003). Approaches to learning, need for cognition, and strategic flexibility among university students. *British Journal of Educational Psychology, 73*, 507-528.

89. Fernández-Ballesteros, R., Díez-Nicolás, J., Vittorio Caprara, G., Barbaranelli, C., & Bandura, A. (2002). Determinants and structural relation of personal efficacy to collective efficacy. *Applied Psychology: An International Review, 51*(1), 107-125. doi: 10.1111/1464-0597.00081

90. Frymire, B. (2006). The search for talent; Business and society. *The Economist, 8498*.

91. George, J. M., & Zhou, J. (2001). When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology, 86*, 513-524.

92. George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology, 87*(4), 687-697.

93. Gilson, L. L. & Shalley, C. E. (2004). A little creativity goes a long way: An examination of teams' engagement in creative processes. *Journal of Management,* 30(4), 453–470.

94. Glöckner, A., & Betsch, T. (2008). Modeling option and strategy choices with connectionist networks: Towards an integrative model of automatic and deliberate decision making. *Judgment and Decision Making, 3*(3), 215–228.

95. Glynn, M. A. (1996). Innovative Genius: A Framework for Relating Individual and Organisational Intelligences. *Academy of Management Review, 21*, 1081–1111.

96. Golembiewski, R. T., & McConkie, M. (1975). The centrality of interper- sonal trust in group process. In C. L. Cooper (Ed.), *Theo-ries of Group Process* (pp. 131-181). London: Wiley.

97. Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work: lessons from feedback-seeking and organizational citizenship behavior research. In B. M. Staw & R. M. Sutton (Eds.), *Research in Organizational Behavior* (Vol. 28, pp. 3-34). Amsterdam: Elsevier.

98. Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: positive behavior in uncertain and interdependent contexts. *Academy of Management Journal, 50*(2), 327–347.

99. Gully, S. M., Incalcaterra, K. A., Joshi, A., & Beaubien, J. M. (2002). A meta-analysis of team-efficacy, potency, and performance: Interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology, 87*, 819–832. doi: 10.1037/0021-9010.87.5.819

100. Guzzo, R. A., Yost, P. R., Campbell, R. J., & Shea, G. P. (1993). Potency in groups: Articulating a construct. *British Journal of Social Psychology, 32*, 87–106. doi: 10.1111/j.2044-8309.1993.tb00987.x

101. Hammond, M. M., Neff, N. L., Farr, J. L., Schwall, A. R., & Zhao, X. (2011). Predictors of individual-level innovation at work: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts, 5*(1), 90-105. doi: 10.1037/a0018556

102. Harrington, D. M., Block, J. H., & Block, J. (1987). Testing aspects of Carl Rogers' theory of creative environments: Child-rearing antece- dents of creative potential in young adolescents. *Journal of Personality and Social Psychology, 52*(4), 851–856. doi: 10.1037/0022-3514.52.4.851

103. Hayashi, A. M. (2001). When to trust your gut. *Harvard Business Review, 79*(2), 59–65.

104. Hinsz, V. B., Tindale, R. S., & Vollrath, D. A. (1997). The emerging conceptualization of groups as informationvprocessors. *Psychological Bulletin, 121*, 43–64. doi: 10.1037/0033-2909.121.1.43

105. Hodgkinson, G. P., & Sadler-Smith, E. (2003). Complex or unitary? A critique and empirical re-assessment of the Allinson–Hayes cognitive style index. *Journal of Occupational and Organizational Psychology, 76*(2), 243–268.

106. Hollenbeck, J., Beersma, B., & Schouten, M. (2012). Beyond team types and taxonomies: A dimensional scaling conceptualization for team description. *Academy of Management Review, 37*(1), 82-106. doi: 10.5465/amr.2010.0181

107. House, R., Rousseau, D. M., & Thomas-Hunt, M. (1995). The meso paradigm: A framework for the integration of micro and macro organizational behavior. In L. Cummings & B. Staw (Eds.), *Research in Organizational Behavior* (Vol. 17, pp. 71-114). London, UK: JAI PRESS LTD.

108. Hulsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology, 94*(5), 1128-1154. doi: 10.1037/a0015978

109. Hunter, S. T., & Cushenbery, L. (2011). Leading for innovation: Direct and indirect influences. *Advances in Developing Human Resource, 13,* 248-265. doi: 10.1177/1523422311424263

110. Hutchinson, S. (2013). *Performance Management: Theory and Practice*. London, UK: Chartered Institute of Personnel & Development.

111. Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From input–process–output models to IMOI models. *Annual Review of Psychology, 56*, 517–543.

112. Isaack, T. S. (1978). Intuition: An ignored dimension of management. *Academy of Management Review, 3*, 917–922.

113. Isaksen, S. (1987). An orientation to the frontiers of creativity research. In S. Isaksen (Ed.), *Frontiers of creativity research: Beyond the basics* (pp. 1-31). Buffalo: Bearly Limited.

114. Isenberg, D. J. (1984). How senior managers think. *Harvard Business Review, 62*(6), 81–90.

115. Jackson, S. E. (1996). The consequences of diversity in multidisciplinary work teams. In M. A. West (Ed.), *Handbook of work group psychology* (pp. 53-75). London: Wiley.

116. Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *Journal of Occupational and Organizational Psychology, 73*(3), 287-302. doi: 10.1348/096317900167038

117. Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly, 40*, 256–282.

118. Jett, Q. R., & Brown, A. A. (2002). *Collective Intuition: The Formation of Shared Experience for Rapid Problem Solving in Innovation Teams*. Working paper. Jesse H Jones Graduate School of Management. Rice University. Houston.

119. Jex, S. M., & Bliese, P. D. (1999). Efficacy beliefs as a moderator of the impact of work-related stressors: a multilevel study. *Journal of Applied Psychology, 84*(3), 349-361. doi: 10.1037/0021-9010.84.3.349

120. Kahneman, D. (2003). A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist, 58*, 697–720.

121. Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics of intuitive judgment: The psychology of intuitive judgment* (pp. 49-81). New York Cambridge University Press.

122. Kanfer, R., & Ackerman, P. L. (2004). Aging, adult development, and work motivation. *Academy of Management Review, 29*(3), 440-458. doi: 10.5465/AMR.2004.13670969

123. Kanter, R. M. (1988). When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organizations. In B. Staw & L. L. Cummings (Eds.), *Research in organizational behaviour* (Vol. 10, pp. 169-211). Greenwich CT: JAI.

124. Kao, J. (1997). The art and discipline of business creativity. *Strategy and Leadership, 25*(4), 6-11. doi: 10.1108/eb054590

125. Katz, R. (1982). The Effects of Group Longevity on Project Communication and Performance. *Administrative Science Quarterly, 27*(1), 81-104. doi: 10.2307/2392547

126. Katzenbach, J. R., & Smith, D. K. (1993). The discipline of teams. *Harvard Business Review, 1*, 111-120.

127. Kearney, E., Gebert, D., & Voelpel, S. C. (2009). When and how diversity benefits teams: The importance of team members' need for cognition. *Academy of Management Journal, 51*(3), 581-598.

128. Keller, R. T. (2001). Cross-functional project groups in research and new product development: Diversity, communications, job stress, and outcomes. *Academy of Management Journal, 44*, 547–555.

129. Kelley, T., Littman, J., & Peters, T. (2001). *The art of innovation: Lessons in creativity from IDEO, America's leading design firm*. New York, NY: Crown Business.

130. Khatri, N., & Ng, A. (2000). The role of intuition in strategic decision making. *Human Relations, 53*(57–86).

131. Kirkman, B. L., & Rosen, B. (1999). Beyond self-management: The antecedents and consequences of team empowerment. *Academy of Management Journal, 42*, 58–74. doi: 10.2307/256874

132. Kozlowski, S. W. J. and B. F. Bell (2001). "*Work groups and teams in organizations"*. Retrieved 10/02/2015, from http://digitalcommons.ilr.cornell.edu/articles/389/.

133. Kozlowski, S. W. J., & Bell, B. S. (2003). Work groups and teams in organizations. In W. C. Borman, D. R. Ilgen & R. J. Klimoski (Eds.), *Handbook of psychology: Industrial and Organizational Psychology* (Vol. 12, pp. 333-375). New York: Wiley.

134. Kozlowski, S. W. J., & Chao, G. T. (2012). The dynamics of emergence: Cognition and cohesion in work teams. *Managerial and Decision Economics, 33*(5-6), 335-354. doi: 10.1002/mde.2552

135. Kozlowski, S. W. J., & Ilgen, D. R. (2006). Enhancing the effectiveness of work groups and teams. *Psychological Science in the Public Interest, 7*(3), 77-124. doi: 10.1111/j.1529-1006.2006.00030.x

136. Kozlowski, S. W. J., & Klein, K. J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal, and emergent processes. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research and methods in organizations: Foundations, extensions, and new directions* (pp. 3-90). San Francisco, CA: Jossey-Bass.

137. Langan-Fox, J., & Shirley, D. A. (2003). The nature andmeasurement of intuition: Cognitive and behavioral interests, personality, and experiences. *Creativity Research Journal, 15*(2), 207–222. doi: 10.1207/S15326934CRJ152&3_11

138. Leavitt, H. (1988). *Managerial psychology: Managing behavior in organizations*. Chicago, IL: Dorsey Press.

139. Leybourne, S., & Sadler-Smith, E. (2006). The role of intuition and improvisation in project management. *International Journal of Project Management, 24*, 483–492.

140. Lieberman, M. D. (2000). Intuition: A Social Cognitive Neuroscience Approach. *Psychological Bulletin, 126*(1). doi: 10.1037//0033-2909.126.1.109

141. Longford, N. T. (1987). Fisher Scoring Algorithm For Variance Component Analysis With Hierarchically Nested Random Effects. *ETS Research Report Series, 1987*(2), i–20. doi: 10.1002/j.2330-8516.1987.tb00236.x

142. Lott, A. J., & Lott, B. E. (1965). Group cohesiveness as interpersonal attraction: A review of relationships with antecedent and consequent variables. *Psychological Bulletin, 64*, 259–309.

143. Lovelace, K., Shapiro, D. L., & Weingart, L. R. (2001). Maximizing cross-functional new products teams' innovativeness and constraints adherence: A conflict communications perspective. *Academy of Management Journal, 44*(4), 779-793.

144. Maier, G. W., Streicher, B., Jonas, E., & Frey, D. (2007). Innovation und Kreativita (Eds.), Enzyklopat [Innovation and creativity]. In L. von Rosenstiel & D. Frey ¨die der

Psychologie, Band Wirtschaftspsychologie [Encyclopedia of psychology, industrial psychology] (pp. 809–855). Gottingen, Germany: Hogrefe.

145. Mainemelis, C. (2010). Stealing fire: Creative deviance in the evolution of new ideas. *Academy of Management Review 35*(4), 558-578.

146. Mansury, M., & Love, J. (2008). Innovation, productivity and growth in US business services: A firm-level analysis. *Technovation, 28*(1-2), 52-62.

147. Manz, C. C., & Sims, H. P. J. (1987). Leading workers to lead themselves. The external leadership of self-managing work teams. *Administrative Science Quarterly, 32*, 106-129. doi: 10.2307/2392745

148. Marcus, A. (1988). Responses to externally induced innovation: Their effects on organizational performance. *Strategic Management Journal, 9*(4), 387-402.

149. Marique, G., Stinglhamber, D., Desmette, F., Caesens, G., & De Zanet, F. (2013). The relationship between perceived organizational support and affective commitment: A social identity perspective. *Group & Organization Management, 38*(1), 68-100. doi: 10.1177/1059601112457200

150. Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *The Academy of Management Review, 26*(3), 356-376. doi: 10.5465/AMR.2001.4845785

151. Mathieu, J. E., & Chen, G. (2011). The Etiology of the Multilevel Paradigm in Management Research. *Journal of Management, 37*(2), 610-641. doi: 10.1177/0149206310364663

152. Maute, M. F., & Locander, C. W. B. (1994). Innovation as a socio-political process: An empirical analysis of influence behavior among new product managers. *Journal of Business Research, 30*(2), 161–174.

153. McAdam, R., & McClelland, J. (2002). Individual and team-based idea generation within innovation management: organisational and research agendas. *European Journal of Innovation Management, 5*(2), 86 - 97. doi: 10.1108/14601060210428186

154. McCraty, P., Atkinson, M., & Bradley, R. T. (2004). Electrophysiological Evidence of Intuition: Part 1. The Surprising Role of the Heart. *Journal of Alternative and Complementary Medicine, 10*(1), 133-143.

155. McLeod, P. L., & Lobel, S. A. (1992). The effects of ethnic diversity on idea generation in small groups. *Academy of Management Best Paper Proceedings*, 227–231.

156. Messick, S. (1976). Personality consistencies in cognition and creativity. In S. Messick (Ed.), *Individuality in Learning* (pp. 4–23). San Francisco: Jossey-Bass.

157. Milliken, F. J., & Martins, L. L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *Academy of Management Review, 21*, 402–433.

158. Mischel, L. J., & Northcraft, G. B. (1997). "I think we can, I think we can...": The role of efficacy beliefs in group and team effectiveness. In B. Markovsky, M. J. Lovaglia & E. J. Lawler (Eds.), *Advances in Group Processes* (Vol. 14, pp. 177-197). Greenwich, CT: JAI press.

159. Mitchell, J. R., Friga, P. N., & Mitchell, R. K. (2005). Untangling the Intuition Mess: Intuition as a Construct in Entrepreneurship Research. *Entrepreneurship Theory and Practice, 29*, 653–679. doi: 10.1111/j.1540-6520.2005.00102.x

160. Mohamed, A. K. M. (2002). Assessing determinants of departmental innovation: An exploratory multi-level approach. *Personnel Review, 31*(5), 620–641. doi: 10.1108/00483480210438799

161. Moreland, R. L., & Levine, J. M. (1992). The composition of small groups. In E. J. Lawler, B. Markovsky, C. Ridgeway & H. A. Walker (Eds.), *Advances in group processes* (Vol. 9, pp. 237-280). Creenwich, CT: JAI Press.

162. Morgeson, F. P., & Hofmann, D. A. (1999). The Structure and Function of Collective Constructs: Implications for Multilevel Research and Theory Development. *Academy of Management Review, 24*(2), 249-265. doi: 10.5465/AMR.1999.1893935

163. Morris, R. (1999). Front-end innovation at AlliedSignal and Alcoa'. *Research Technology Management, 42*(6), 15-24.

164. Olson, P. D. (1985). Entrepreneurship: Process and abilities. *American Journal of Small Business, 10*, 25–31.

165. Osborn, A. F. (1957). *Applied imagination*. New York: Scribner.

166. Pacini, R., & Epstein, S. (1999). The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology, 76*(6), 972-987. doi: 10.1037/0022-3514.76.6.972

167. Park, H. S., Baker, C., & Lee, D. W. (2008). Need for Cognition, Task Complexity, and Job Satisfaction. *Journal of Management in Engineering, 24*(2), 111-130.

168. Parker, L. E. (1994). Working together: Perceived self- and collective eficacy at the workplace. *Journal of Applied Social Psychology, 24*(1), 43-59. doi: 10.1111/j.1559-1816.1994.tb00552.x

169. Parker, S. K., Bindl, U. K., & Strauss, K. (2010). Making things happen: A model of proactive motivation. *Journal of Management, 36*(4), 827-856. doi: 10.1177/0149206310363732

170. Parker, S. K., & Sprigg, C. A. (1999). Minimizing strain and maximizing learning: The role of job demands, job control, and proactive personality. *Journal of Applied Psychology, 84*(6), 925–939. doi: 10.1037/0021-9010.84.6.925

171. Parsons, T. (1951). *The social system*. Glencoe, IL: Free Press.

172. Patterson, F., Kerrin, M., & Gatto-Roissard, G. (2009). Characteristics and Behaviours of Innovative People in Organisations *Literature Review for the NESTA Policy & Research Unit* (pp. 1-63). London: NESTA.

173. Paulus, P. B. (2002). Different Ponds for Different Fish: A Contrasting Perspective on Team Innovation. *Applied Psychology: An International Review, 51*(3), 394–399. doi: 10.1111/1464-0597.00973

174. Pelled, L. H. (1996). Demographic diversity, conflict, and work group outcomes: An intervening process theory. *Organization Science, 7*, 615–631.

175. Pervin, L. A. (1980). *Personality theory and assessment*. New York Wiley.

176. Pinchot, G. (1985). *Intrapreneuring*. New York: Harper and Row.

177. Pirola-Merlo, A., & Mann, L. (2004). The relationship between individual creativity and team creativity: Aggregating across people and time. *Journal of Organizational Behavior, 25*, 235–257.

178. Podsakoff, P. M., MacKenzie, S. B., Lee, J., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903. doi: 10.1037/0021-9010.88.5.879

179. Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly, 1*(2), 107–142. doi: 10.1016/1048-9843(90)90009-7

180. Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 65*, 539-569. doi: 10.1146/annurev-psych-120710-100452

181. Post, C. (2012). Deep-level team composition and innovation: The mediating roles of psychological safety and cooperative learning. *Group & Organization Management, 7*(5), 555-588. doi: 10.1177/1059601112456289

182. Prahalad, C. K., & Krishnan, M. S. (2008). *The New Age of Innovation: Driving co-created value through global networks*. New York: McGraw-Hill Books.

183. Raudenbush, S. W., & Bryk, A. S. (1986). A Hierarchical Model for Studying School Effects. *Sociology of Education, 59*(1), 1-17.

184. Reiter-Palmon, R., Herman, A. E., & Yammarino, F. (2008). Beyond Cognitive Processes: Antecedents and Influences on team cognition. In M. D. Mumford, S. T. Hunter & K. E. Bedell-Avers (Eds.), *Multi-level Issues in Creativity and Innovation* (Vol. 7). Greenwich, CT: JAI Press.

185. Riggs, M., Warka, J., Babasa, B., & al, e. (1994). Development and validation of self-efficacy and outcome expectancy scales for job-related applications. *Educational And Psychological Measurement, 54*(3), 793-802.

186. Rogers, E. M. (1983). *Diffusion of Innovations*. New York: Free Press.

187. Rogers, E. M., & Shoemaker, F. F. (1971). *Communication of innovations: a cross-cultural approach*. New York: The Free Press.

188. Rousseau, D. M. (1985). Issues of level in organizational research: Multi-level and cross-level perspectives. *Research in Organizational Behavior, 7*, 1-37. doi: 10.1177/0149206310371692

189. Rusou, Z., Zakay, D., & Usher, M. (2013). Pitting intuitive and analytical thinking against each other: The case of transitivity. *Psychonomic Bulletin & Review, 20*(3), 608-614. doi: 10.3758/s13423-013-0382-7

190. Saavedra, R., Earley, P. C., & Van Dyne, L. (1993). Complex interdependence in task-performing groups. *Journal of Applied Psychology, 78*, 61–72.

191. Sadler-Smith, E. (1998). Cognitive style: Some human resource implications for managers. *The International Journal of Human Resource Management, 9*(1), 185-202.

192. Sadler-Smith, E., & Riding, R. J. (1999). Cognitive style and instructional preferences. *Instructional Science, 27*(5), 355–371.

193. Sadler-Smith, E., & Shefy, E. (2004). *Developing intuition: Becoming smarter by thinking less*. Paper presented at the Academy of Management.

194. Sadler-Smith, E., & Shefy, E. (2007). Developing intuitive awareness in mnagement education. *Academy of Management Learning and Education, 6*(2), 186-205. doi: 10.5465/AMLE.2007.25223458

195. Salas, E., Rosen, M. A., & DiazGranados, D. (2010). Expertise-based intuition and decision making in organizations. *Journal of Management, 36*, 941–973.

196. Samples, B. (1976). *The Metaphoric Mind: A Celebration of Creative Consciousness*. Reading, MA: Addison-Wesley Publishing Company.

197. Schaubroeck, J., Lam, S. S. K., & Cha, S. E. (2007). Embracing transformational leadership: Team values and the impact of leader behavior on team performance. *Journal of Applied Psychology, 92*(4), 1020-1030. doi: 10.1037/0021-9010.92.4.1020

198. Schumpeter, J. (1934). *Capitalism, socialism, and democracy*. New York Harper & Row.

199. Scott, S. G., & Brouce, A. R. (1994). Determinants of Innovative Behaviour: A Path Model of Individual Innovation in the Workplace. *The Academy of Management Journal, 37*(3), 580-607. doi: 10.2307/256701

200. Seibert, S. E., Kraimer, M. L., & Crant, J. N. (2001). What do proactive people do? A longitudinal model linking proactive personality and career success. *Personnel Psychology*, *54*, 845– 874. doi: 10.1111/j.1744-6570.2001.tb00234.x

201. Sethi, R. S., Smith, D. C., & Park, C. (2001). Cross-functional product development teams, creativity, and the innovativeness of new consumer products. *Journal of Marketing Research, 38*(1), 73-85. doi: 10.1509/jmkr.38.1.73.18833

202. Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *Leadership Quarterly, 15*, 33–53.

203. Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here. *Journal of Management, 30*, 933-958.

204. Sheikhiani, M., Bindu, P. N., & Fakouri, Z. (2011). Proactive coping skills and self-efficacy beliefs of women teacher students. *Indian Journal of Life Skills Education, 3*(1), 449-464.

205. Sinclair, M., & Ashkanasy, N. M. (2005). Intuition: Myth or decision making tool? *Management Learning, 36*(3), 353–370. doi: 10.1177/1350507605055351

206. Škerlavaj, M., Černe, M., & Dysvik, A. (2014). I get by with a little help from my supervisor: Creative-idea generation, idea implementation, and perceived supervisor support. *The Leadership Quarterly, 35*(5), 987-1000. doi: http://dx.doi.org/10.1016/j.leaqua.2014.05.003.

207. Škerlavaj, M., Song, J. H., & Lee, Y. (2010). Organizational learning culture, innovative culture and innovations in South Korean firms. *Expert Systems with Applications, 37*(9), 6390–6403.

208. Sloman, S. A. (2002). Two systems of reasoning. In T. Gilovich, D. Griffin & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (Vol. 379–96)). New York: Cambridge University Press.

209. Somech, A. (2006). The effects of leadership style and team process on performance and innovation in functionally heterogeneous teams. *Journal of Management, 32*, 132–157.

210. Somech, A., & Drach-Zahavy, A. (2011). Translating team creativity to innovation implementation: The role of team composition and climate for innovation. *Journal of Management*, Published online before print February 7, 2011. doi: 10.1177/0149206310394187

211. Somech, A., & Drach-Zahavy, A. (2013). Translating Team Creativity to Innovation Implementation: The Role of Team Composition and Climate for Innovation. *Journal of Management, 39*(3), 684-708. doi: 0.1177/0149206310394187

212. Staw, B. M., & Ross, J. (1980). Commitment in an experimenting society: A study of the attribution of leadership from administrative scenarios. *Journal of Applied Psychology, 65*(3), 49-260. doi: 10.1037/0021-9010.65.3.249

213. Stewart, G. L. (2006). A meta-analytic review of relationships between team design features and team performance. *Journal of Management, 32*, 29–54.

214. Sundstrom, E. (1999). The challenges of supporting work team effectiveness. In E. S. Associates (Ed.), *Supporting work team effectiveness: Best management practices for fostering high performance* (Vol. 3-23). San Francisco, CA: Jossey-Bass.

215. Taggar, S. (2002). Individual creativity and group ability to utilize individual creative resources: Multilevel model. *Academy Management Journal, 45*(2), 315-330. doi: 10.2307/3069349

216. Taggart, W., & Valenzi, E. (1990). Assessing rational and intuitive styles: a human information processing metaphor. *Journal of Management Studies, 27*(2), 149–172.

217. Tasa, K., Sears, G. J., & Schat, A. C. H. (2011). Personality and teamwork behavior in context: The cross-level moderating role of collective efficacy. *Journal of Organizational Behaviour, 32*, 65–85. doi: 10.1002/job.680

218. Tasa, K., Taggar, S., & Seijts, G. H. (2007). The development of collective efficacy in teams: A multilevel and longitudinal perspective. *Journal of Applied Psychology, 92*(1), 17–27. doi: 10.1037/0021-9010.92.1.17

219. Templar, R. (2011). *The Rules of Management*. Harlow, UK: Pearson Education ltd. .

220. Tjosvold, D., Tang, M. M. L., & West, M. A. (2004). Reflexivity for team innovation in China. *Group and Organization Management, 29*, 540–559.

221. Tuuli, M. M. (2012, 24-26 July 2012). *Competing models of how motivation, opportunity, and ability drive job performance in project teams.* Paper presented at the Proceedings of the 4th West Africa Built Environment Researchers (WABER) Conference, Abuja, Nigeria.

222. Twiss, B. (1974). *Managing Technological Innovation*. London: Pitman.

223. Tyran, K. L., & Gibson, C. B. (2008). Is what you see, what you get?: The relationship among surface and deep-level heterogeneity characteristics, group efficacy, and team reputation. *Group & Organization Management, 33*(1), 46-76. doi: 10.1177/1059601106287111

224. Utterback, J.M. (1971). The process of technological innovation within the firm. *Academy of Management Journal*, 10(1) 75–88.

225. Van de Ven, A. H. (1986). Central problems in the management of innovation. *Management Science, 32*(5), 590-607.

226. Van de Ven, A. H., & Sun, K. (2011). Breakdowns in Implementing Models of Organization Change. *Academy of Management Perspectives, 25*(3), 58-74.

227. Van der Vegt, G., & Van de Vliert, E. (2002). Intragroup interdependence and effectiveness: Review and proposed directions for theory and practice. *Journal of Managerial Psychology, 17*, 50–67.

228. Van Offenbeek, M., & Koopman, P. (1996). Interaction and decision making in project teams. In M. A. West (Ed.), *Handbook of work group psychology* (pp. 159-187). London: Wiley.

229. Wang, P., Walumbwa, F. O., Wang, H., & Aryee, S. (2013). Unraveling the relationship between family-supportive supervisor and employee performance. *Group & Organization Management, 38*(2), 258-287. doi: 10.1177/1059601112472726

230. West, M. A. (1987). A measure of role innovation at work. *British Journal of Social Psychology, 26*(4), 83-85.

231. West, M. A. (1990a). *Innovation and Creativity at Work: Psychological and Organizational Strategies*. Chinchester: Wiley.

232. West, M. A. (1990b). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), *Innovation and creativityat work: Psychological and organizational strategies* (pp. 309-335). Chichester: Wiley.

233. West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology: An International Review, 51*, 355-387. doi: 10.1111/1464-0597.00951

234. West, M. A., & Anderson, N. (1996). Innovation in top management teams. *Journal of Applied Psychology, 81*(6), 680-693.

235. West, M. A., & Farr, J. L. (1989). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work* (pp. 3-13). Chichester, UK: Wiley.

236. West, M. A., Tjosvold, D., & Smith, K. G. (2003). *The essentials of teamworking: International perspectives*: Wiley-Blackwell.

237. West, M. A., & Wallace, M. (1991). Innovation in health care teams. *British Journal of Social Psychology, 21*, 303-315.

238. Williams, H. M., Parker, S. K., & Turner, N. (2010). Proactively performing teams: The role of work design, transformational leadership, and team composition. *Journal of Occupational and Organizational Psychology*, *83*(2), 301-324. doi: 10.1348/096317910x502494

239. Witteman, C., van den Bercken, J., Claes, L., & Godoy, A. (2009). Assessing rational and intuitive thinking styles. *European Journal of Psychological Assessment*, *25*(1), 39-47. doi: 10.1027/1015-5759.25.1.39

240. Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Towards a theory of organizational creativity. *Academy of Management Review, 18*, 293–321.

241. Wu, C.-H., Parker, S. K., & de Jong, J. P. J. (2011). Need for Cognition as an Antecedent of Individual Innovation Behavior. *Journal of Management, first published on December 21, 2011*.

242. Yesil, S., & Sozbilir, F. (2013). An Empirical Investigation into the Impact of Personality on Individual Innovation Behaviour in the Workplace. *Procedia - Social and Behavioral Sciences, 81*(28), 540-551. doi: 10.1016/j.sbspro.2013.06.474

243. Zhuang, L., Williamson, D., & Carter, M. (1999). Innovate or liquidate are all organisations convinced? *Management Decision, 37*(1), 57-71.

APPENDICES

APPENDICES

Appendix A: Team member questionnarie (English)

In front of you is a survey "A Multilevel Approach in Examining Micro Foundations Of Team Innovation". The questionnaire is designed to help us gain better understanding of employees' innovative processes. Your answers will be kept strictly confidential and anonymous. Survey results will be published only in aggregate form and individual answers will not be evident. There are no right and wrong answers.
If you have any problems or questions please do not hesitate to contact me via email: jana.krapez@ef.uni-lj.si.
I would like to thank you already in advance for you cooperation in the survey.
To begin with the questionnaire, please click on the button below "Next".

1. Please choose your team leader.

2. This part includes statements about your personal or your team attitudes and traits and it will take you approximately 15 minutes to fill it out. Please indicate <u>your feelings</u> about each statement below by marking the answer that best describes your attitude or feeling. Please be very truthful and describe yourself or your team as you really are, not as you would like to be..

Think about **your feelings as bases** for decision-making.

Intuition	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
When making decisions, I relay upon my instincts.					
When making decisions, I tend to rely on my intuition.					
I generally make decisions, which feel right to me.					
When I make a decision, it is more important for me to feel the decision is right than to have a rational reason for it.					
When I make a decision I trust my inner feelings and reactions.					

Think about your **team members' confidence and style** in decision-making.

Team Intuition	Not at all	Limited extent	Not sure	Certain extent	Large Extent
To what extent did participants in this project rely basically on personal judgment?					
On many occasions, the members of our team did not have enough information and had to make some decisions based on a "gut feeling." To what extent did the team members in this project depend on a "gut feeling"?					
Did team members trust their hunches when confronted by an important decision during this project?					
Did team members put a lot of faith in their initial feelings about other people and situations?					
Did team members put more emphasis on feelings than data when making decisions during this project?					
Did team members' intuition turn out to have been right all along?					
In general, how would you describe the process of working in this project?					

Think about the extent to which **you are** inclined towards **effortful thinking**.

Need for cognition	Extremely uncharacteristic	Little uncharacteristic	Not sure	Little characteristic	Extremely characteristic
I would prefer complex to simple problems.					
I like to have responsibility of handling a situation that requires a lot of thinking.					
Thinking is not my idea of fun. ®					
I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. ®					
I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something. ®					
I find satisfaction in deliberating hard and for long hours.					
I only think as hard as I have to. ®					
I prefer to think about small, daily projects to long-term ones. ®					
I like tasks that require little thought once I've learned them. ®					
The idea of relaying on thought to make my way to the top appeals me.					
I really enjoy a task that involves coming up with new solutions to problems.					
Learning new ways to think doesn't excite me very much. ®					
I prefer my life to be filled with puzzles that I must solve.					
The notion of thinking abstractly is appealing to me.					
I would prefer a task that is intellectual, difficult and important to one that is somewhat important but does not require much thought.					
I feel relief rather satisfaction after completing a task that required a lot of mental effort. ®					
It's enough for me that something gets the job done; I don't care how or why it works. ®					
I usually end up deliberating about issues even when they do not affect me personally.					

Here, think about **your relationship** with your leader.

Team-level LMX				
Do you know where you stand with your leader... do you usually know how satisfied your leader is with what you do?				
Rarely	Occasionally	Sometimes	Fairly Often	Very Often
How well does your leader understand your job problems and needs?				
Not a Bit	A Little	A Fair Amount	Quite a Bit	A Great deal
How well does your leader recognize your potential?				
Not at All	A Little	Moderately	Mostly	Fully
Regardless of how much formal authority he/she has built into his/ her position, what are the chances that your leader would use his/ her power to help you solve problems in your work?				
None	Small	Moderate	High	Very high
Again, regardless of the amount of formal authority your leader has, what are the chances that he/ she would "bail you out," at his/ her expense?				
None	Small	Moderate	High	Very high
I have enough confidence in my leader that I would defend and justify his/ her decision if he/she were not present to do so?				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
How would you characterize your working relationship with your leader?				
Extremely Ineffective	Worse Then Average	Average	Better Than Average	Extremely Effective

Now, think about **your ability** to do the tasks required by your job.

Self-efficacy	Strongly disagree	Disagree	Disagree somewhat	Undecided	Agree somewhat	Agree	Strongly agree
My new job is well within the scope of my abilities.							
I do not anticipate any problems in adjusting to work in this organization.							
I feel I am overqualified for the job I will be doing.							
I have all the technical knowledge I need to deal with my new job, all I need now is practical experience.							
I feel confident that my skills and abilities equal or exceed those of my future colleagues.							
My past experiences and accomplishments increase my confidence that I will be able to perform successfully in this organization.							
I could have handled a more challenging job than the one I will be doing.							
Professionally speaking, my new job exactly satisfies my expectations of myself ®.							

Think about the team in which you work and **team's work-related activity**.

Collective-efficacy	Completely Inaccurate	Very Inaccurate	Probably Inaccurate	Sometimes Accurate, Sometimes Inaccurate	Probably Accurate	Very Accurate	Completely Accurate
The team I work with has above average ability.							
This team is poor compared to other teams doing similar work.							
This team is not able to perform as well as it should.							
The members of this team have excellent job skills.							
Some members of this team should be fired due to lack of ability.							
This team is not very effective.							
Some members in this team cannot do their jobs well.							

Think about **your proactive personality** at your job.

Individual proactivity	Not true at all	Not true	Sometimes true, sometimes not	True	Very true
No matter what the odds, if I believe in something I will make it happen.					
I love being a champion for my ideas, even against others' opposition.					
If I believe in an idea, no obstacle will prevent me from making it happen.					
I am excellent at identifying opportunities.					

Think about the **team's proactivity**.

Team-level proactivity	Very little proactivity	Little proactivity	Sometimes proactive, sometimes not	High proactivity	Very high proactivity
Suggested ways to make your work unit more effective.					
Developed new and improved methods to help your work unit perform better.					
Improved the way your work unit does things.					

Now, answer in reference to your sense of confidence in **team's behaviour, response.**

Psychological safety	Very inaccurate	Moderately inaccurate	Slightly inaccurate	Neither accurate nor inaccurate	Slightly accurate	Moderately accurate	Very accurate
If members make a mistake on this team, it is often held against you. ®							
Members of this team are able to bring up problems and tough issues.							
People on this team sometimes reject others for being different. ®							
It is safe to take a risk on this team.							
It is difficult to ask other members of this team for help. ®							
No one on this team would deliberately act in a way that undermines my efforts.							
Working with members of this team, my unique skills and talents are valued and utilized.							

Think about the team in which you work and how much **does your supervisor (team leader) encourages** employees to engage in....

Supportive Supervision (extent that team leader/supervisor...)	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Encourages us to expect a lot from ourselves.					
Encourages us to set targets for our team performance.					
Encourages us to praise each other for doing a good job.					
Encourages us to be aware of our level of performance.					

Please describe how much your **team leader (supervisor)** uses the effort to influence you. If an item does not apply to your situation, then use the "I can't remember him/her ever using this tactic with me" response.

Inspirational appeal (This person . . .)	I can't remember him/her ever using this tactic with me	He/she very seldom uses this tactic with me	He/she occasionally uses this tactic with me	He/she uses this tactic moderately often with me	He/she uses this tactic very often with me e
Says a proposed activity or change is an opportunity to do something really exciting and worthwhile.					
Describes a clear, inspiring vision of what a proposed project or change could accomplish.					
Talks about ideals and values when proposing a new activity or change.					
Makes an inspiring speech or presentation to arouse enthusiasm for a proposed activity or change.					

DEMOGRAPHIC INFORMATION

Gender:
Female (1)
Male (2)

Nationality:

Age:
20 up to 30
30 up to 40
40 up to 50
50 up to 60
60 or more

Education level:
Professional High School (1)
High School (2)
College degree (3)
University degree (4)
Master's Degree (5)
PhD (6)

How many years have you been working for this company?
0-1
1-3
3-5
5-10
more than 10

How many years have you been working with your current team (in this constellation)?
0-1
1-3
3-5
5-10
more than 10

How many years have you been working with your current leader?
0-1
1-3
3-5
5-10
more than 10

Your job is:
Full-time (1)
Part-time (2)

Do you currently have any managerial duties?
No (1)
Yes (2)

Appendix B: Team member questionnarie (Slovenian)

Pred vami je vprašalnik "*Večnivojski pristop k preučevanju mikro-osnov timskih inovacij*. S pomočjo vprašalnika bi rada pridobila boljši vpogled v inovativne procese zaposlenih. Vaši odgovori bodo strogo zaupni in anonimni. Rezultati raziskave bodo objavljeni samo v agregatni obliki in posamezni odgovori ne bodo razvidni. Prav tako ni pravilnih ali napačnih odgovorov. V kolikor naletite na težave pri izpolnjevanju vprašalnika vas prosim, da me kontaktirate preko e-pošte: jana.krapez@ef.uni-lj.si.

Že vnaprej se najlepše zahvaljujem za vaše sodelovanje v raziskavi.

Za začetek izpolnjevanja vprašalnika, prosim kliknite na spodnji gumb "Start".

1. Izberite vodjo tima.

2. Vprašalnik vključuje izjave o vaših osebnih in timskih lastnostih, prepričanjih in vedenju ter vam bo vzel približno 15 min da ga izpolnite. Prosimo, da svoje mnenje o vsaki izjavi izrazite z izbiro enega izmed podanih odgovorov, ki najbolje opisuje vaš prepričanje ali občutje. Prosimo vas za odkritost pri opisu sebe in svoje ekipe in da podate mnnje o tem kakšni ste v realnosti in ne kot bi želeli biti.

Pomislite na SVOJE OBČUTKE kot osnovo za odločitve.

Intuicija	Se ne strinjam	Delno se ne strinjam	Niti strinjam niti ne strinjam	Delno se strinjam	Popolnoma se strinjam
Pri odločanju se zanašam na svoje instinkte.					
Pri odločanju se zanašam na svojo intuicijo.					
Na splošno sprejemam odločitve, ob katerih imam dober občutek.					
Ko sprejmem odločitev, je bolj pomembno, da imam dober občutek o njej, kot da imam racionalne razloge zanjo.					
Pri odločanju zaupam svojim notranjim občutkom in reakcijam.					

Razmislite o ZAUPANJU in STILU ČLANOV VAŠE EKIPE v svoje odločitve.

Timska intuicija	Niti najmanj	V omejenem obsegu	Nisem prepričan	V večjem obsegu	V celoti
V kolikšni meri so se udeleženci projekta zanašali predvsem na osebno presojo?					
Člani našega tima velikokrat niso imeli dovolj informacij in so zato morali sprejeti nekatere odločitve na podlagi občutka. V kolikšni meri so se zanašali na občutek pri odločitvah v tem projektu?					
Ali so člani tima zaupali svojim občutkom, ko so se soočili s pomembno odločitvijo v tem projektu?					
Ali so člani tima zelo zaupali svojim prvim občutkom o drugih ljudeh in situacijah?					
Ali so člani tima bolj zaupali občutkom kot podatkom pri sprejemajo odločitev na tem projektu?					
Ali se je intuicija članov tima izkazala za pravilno?					
Na splošno, kako bi opisali delavni postopek tega projekta?					

V kolikšnem obseg ste VI nagnjeni k PRIZADEVANJU ZA RAZMIŠLJANJE?

Potreba po spoznanju	Zelo neznačilna	Precej neznačilna	Nisem prepričan	Dokaj značilna	Zelo neznačilna
Osebno preferiram zahtevnejše pred enostavnejšimi problemi.					
Všeč mi je nositi odgovornost v situaciji, ki zahteva veliko razmišljanja.					
Razmišljanje ni moj način zabave. ®					
Raje postorim nekaj, kar zahteva malo razmišljanja kot nekaj, kar predstavlja izziv mojim sposobnostim razmišljanja. ®					
Poskušam predvideti in se izogniti situacijam, kjer je velika verjetnost, da bom moral o nečem globoko razmišljati. ®					
V težkih in dolgih razpravah najdem zadovoljstvo.					
Razmišljam samo tako globoko, kot moram. ®					
Raje razmišljam o manjših, vsakodnevnih projektih kot o dolgoročnih. ®					
Raje imam naloge, ki zahtevajo malo dodatnega razmišljanja po tem, ko enkrat osvojiš znanje. ®					
Privlači me ideja, da bi svojo pot na vrh dosegel z zanašanjem na svoj razum.					
Resnično uživam v nalogi, ki zahteva nove rešitve za probleme.					
Učenje novih načinov razmišljanja me ne vznemirja. ®					
Raje vidim, da je moje življenje prepleteno z ugankami, ki jih moram rešiti.					
Pojem abstraktno razmišljanje me privlači.					
Preferiral bi nalogo, ki je intelektualno zahtevna in pomembna kot pa naloga, ki je nekoliko pomembna, vendar ne zahtevna veliko razmišljanja.					
Ko zaključim mentalno zahtevno nalogo čutim več olajšanja kot pa zadovoljstva. ®					
Zame je dovolj, da je delo opravljeno in mi ni mar, kako in zakaj deluje. ®					
Običajno vedno zaključim z razpravljanjem o problematiki, četudi name osebno ne vpliva.					

Pomislite na VAŠ ODNOS z VODJO vašega TIMA.

Odnos vodja-zaposleni na timskem nivoju				
Ali veste, kako se razumete z vodjo. Se običajno zavedate, kako zadovoljen je vodja z vašim delom?				
Redko	Občasno	Včasih	Dokaj pogosto	Zelo pogosto
Kako dobro vaš vodja razumem vaše težave in potrebe pri delu?				
Niti malo	Malo	Srednje	Dokaj	Veliko
Kako dobro vaš vodja prepozna vaš potencial?				
Sploh ne	Malo	Zmerno	Večinoma	V celoti
Ne glede na to, koliko avtoritete in moči ima na svoji poziciji, kakšne so možnosti, da bi vaš vodja uporabil svojo moč, da vam pomaga rešiti težave pri vašem delu?				
Nikakršne	Majhne	Srednje	Velike	Zelo velike
Ne glede na to, koliko avtoritete in moči ima na svoji poziciji, kakšne so možnosti, da bi vaš vodja uporabil svojo moč, da vam pomaga iz težav na svoj račun?				
Nikakršne	Majhne	Srednje	Velike	Zelo velike
Imam dovolj zaupanja v svojega vodjo, da bi ga zagovarjal in opravičil njegovo odločitev, če on ne bi bil prisoten, da bi to storil?				
Močno se ne strinjam	Se ne strinjam	Nevtralen	Strinjam se	Močno se strinjam
Kako bi opisali svoj delovni odnos s svojo vodjo?				
Izjemno neučinkovit	Slabši od povprečja	Povprečen	Boljši kot v povprečju	Izredno učinkovit

Sedaj pa pomislite na VAŠO SPOSOBNOST opravljanja delovnih nalog.

Koncept samoučinkovitosti	Popolnoma se ne strinjam	Se ne strinjam	Delno se ne strinjam	Niti strinjam niti ne strinjam	Delno se strinjam	Strinjam se	Popolnoma se strinjam
Moje novo delo je v okviru mojih zmožnosti.							
Ne pričakujem nobenih težav pri prilagajanju delu v tej organizaciji.							
Čutim, da sem previsoko kvalificirana za bodoče delo.							
Imam vso tehnično znanje, ki ga potrebujem za mojo novo službo, vse kar sedaj potrebujem, so praktične izkušnje.							
Prepričan sem, da so moje znanje in sposobnosti enake ali višje od tistih, ki jih imajo moji bodočih sodelavci.							
Moje pretekle izkušnje in dosežki povečajo mojo samozavest, da bom lahko uspešno opravljal svoje delo v tej organizaciji.							
Lahko bi opravljal bolj zahtevno delo, kot to, ki ga trenutno opravljam.							
Strokovno rečeno, moje novo delo izpolnjuje moja osebna pričakovanja ®.							

Razmišljajte o svojem timu in o DELOVNIH SPOSOBNOSTIH VAŠEGA TIMA.

Kolektivna samoučinkovitost	Zelo nenatančno	Dokaj nenatančno	Verjetno nepravilno	Včasij pravilno, včasih nepravilno	Verjetno pravilno	Dokaj natančno	Zelo natančno
Tim v katerem delam ima nad povprečne sposobnosti.							
Ta tim je slab v primerjavi z drugimi oddelki, ki opravljajo podobno delo.							
Ta tim ne more opravljati dela tako dobro, kot bi moral.							
Člani tega tima imajo odlične sposobnosti za delo.							
Nekateri člani tega tima bi morali biti odpuščeni zaradi pomanjkanja sposobnosti.							
Ta tim ni preveč učinkovit.							
Nekateri člani v tem timu ne morejo dobro opraviti svojega dela.							

Razmišljajte o VAŠI PROAKTIVNI OSEBNOSTI na delu.

Proaktivnost	Niti najmanj	V omejenem obsegu	Nisem prepričan	V večjem obsegu	V celoti
Če v nekaj verjamem bom ne glede na verjetnost to uresničil.					
Rad sem prvak za moje ideje, tudi ko se drugi ne strinjajo z mano.					
Če verjamem v idejo, ni ovire, ki bi mi preprečila njeno uresničitev.					
Menim, da sem odličen pri prepoznavanju priložnosti.					

Razmišljajte o PROAKTIVNOSTI VAŠEGA TIMA.

Timska proaktivnost	Zelo nizka proaktivnost	Nizka proaktivnost	Včasih proaktiven, včasih ne	Visoka proaktivnost	Zelo visoka proaktivnost
Predlagati načine kako povečati učinkovitost delovne enote.					
Razviti nove in izboljšane metode da bo vaša enota bolje opravljala svoje delo.					
Izboljšati način izvajanja obveznosti vašega tima.					

Odgovorjate v zvezi z vašim prepričanjem v ODNOS IN ODZIV VAŠEGA TIMA.

Psihološka varnost	Zelo nepravilno	Dokaj nepravilno	Malenkost nepravilno	Ne nepravilno ne pravilno	Malenkos pravilno	Dokaj pravilno	Zelo pravilno
Če člani tima storijo napako je to pogosto uporabljeno proti njim. ®							
Člani tima lahko izpostavijo probleme in težave.							
Člani tima včasih zavrnejo druge, ker so drugačni. ®							
Znotraj tega tima je varno sprejeti tveganje.							
Znotraj tima je težko vprašati druge člane za pomoč. ®							
Nihče izmed članov tima bi namerno ogrožal moj trud.							
Delo s člani tima, moje edinstvene sposobnosti in talenti so cenjeni in izkoriščeni.							

Pomislite na VODJO VAŠEGA TIMA in koliko vas SPODBUJA pri…

Podpora vodstva (Stopnja, da katere nas vodja tima/mentor...)	Se ne strinjam	Delno se ne strinjam	Niti strinjam niti ne strinjam	Delno se strinjam	Strinjam se
Spodbuja, da naj veliko pričakujemo od sebe.					
Spodbuja, da naj določimo cilje za uspeh tima.					
Spodbuja, da pohvalimo drug drugega za dobro opravljeno delo.					
Spodbuja, da se zavedamo naših zmogljivosti.					

Opišite, koliko si vaš VODJA TIMA prizadeva, da bi VPLIVAL NA VAS. V kolikor se izjava ne nanaša na vas izberite odgovor "ne morem se spomniti, da bi kdaj uporabil to taktiko".

Sklicevanje na inspiracijo (Ta oseba . . .)	Ne morem se spomniti, da bi kdaj uporabil to taktiko	To taktiko zelo redko uporabi z mano	To taktiko občasno uporabi z mano	To taktiko pogosto uporabi z mano	To taktiko zelo pogosto uporabi z mano
Pravi da so predlagane dejavnosti ali spremembe priložnost, da ustvarim nekaj zares zanimivega in koristnega.					
Opiše jasno, navdihujočo vizijo o tem kaj bi predlagani projekt ali sprememba lahko dosegel.					
Razlaga o idealih in vrednotah, med tem ko predlaga nove aktivnosti ali spremembe.					
Pripravi navdihujoč govor ali predstavitev, da bi vzbudil/a navdušenje za predlagane aktivnosti ali spremembe.					

DEMOGRAFSKI PODATKI

Spol:
Ženski (1)
Moški (2)

Država:

Starost:
20-30
30-40
40-50
50-60
60 ali več

Stopnja izobrazbe:
Poklicna srednja šola (1)
Gimnazija (2)
Visoka šola ali specializacija (3)
Univerzitetna izobrazba (4)
Magistrska izobrazba (5)
Doktorat (6)

Koliko let ste že zaposleni v tem podjetju?
0-1
1-3
3-5
5-10
več kot 10

Koliko let vaš tim že dela skupaj?
0-1
1-3
3-5
5-10
več kot 10

Koliko let že sodelujete s svojim trenutnim vodjo?
0-1
1-3
3-5
5-10
več kot 10

Vaša zaposlitev je:
Polni delovni čas (1)
Polovični delovni čas (2)

Imate trenutne kakšne managerske dolžnosti?
Ne (1)
Da (2)

Appendix C: Team leader questionnarie (English)

In front of you is a survey "*A Multilevel Approach in Examining Micro Foundations Of Team Innovation*", which is an important part of my PhD research. The bellow questionnaire is designed to help us gain better understanding of employees' innovative processes. Your answers will be kept strictly confidential and anonymous. Survey results will be published only in aggregate form and individual answers will not be evident. There are no right and wrong answers. If you have any problems or questions please do not hesitate to contact me via email: jana.krapez@ef.uni-lj.si.
I would like to thank you already in advance for you cooperation in the survey.

To begin with the questionnaire, please click on the button below "*Start*".

1. Please choose your name as a leader.

2. This following part deals with your personal or your team attitudes and traits and will take you approximately 5 minutes to fill it out. Please indicate <u>your feelings</u> about each statement below by marking the answer that best describes your attitude or feeling. Please be very truthful and describe yourself or your team as you really are, not as you would like to be.

Think about **your relationship** with **your team** members.

Team-level LMX				
Does your member usually know where he, she stands with his, her leader... does he, she usually know how satisfied you are with what he, she does?				
Rarely	Occasionally	Sometimes	Fairly Often	Very Often
How well do you understand members' job problems and needs?				
Not a Bit	A Little	A Fair Amount	Quite a Bit	A Great deal
How well do you recognize member's potential?				
Not at All	A Little	Moderately	Mostly	Fully
What are the chances that you would use your power to help solve member problems in his, her work?				
None	Small	Moderate	High	Very high
What are the chances that you would "bail him, her out," at your expense?				
None	Small	Moderate	High	Very high
Your member would defend and justify your decision if you were not present to do so?				
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
How would you characterize your working relationship with your member?				
Extremely Ineffective	Worse Then Average	Average	Better Than Average	Extremely Effective

.

Think about your team.

Please indicate to what extent **your team** develops ideas concerning the following aspects of work.

My team generates ideas about:	No new ideas generated 1	2	3	4	5	6	Many new ideas generated 7
1. new targets or objectives	❒	❒	❒	❒	❒	❒	❒
2. new methods to achieve work targets	❒	❒	❒	❒	❒	❒	❒
3. new working methods or techniques	❒	❒	❒	❒	❒	❒	❒
4. new information or recording systems	❒	❒	❒	❒	❒	❒	❒
5. new products or product improvements	❒	❒	❒	❒	❒	❒	❒
6. new processes	❒	❒	❒	❒	❒	❒	❒
7. other aspects of work	❒	❒	❒	❒	❒	❒	❒

When you think about the **ideas generated by your team**, how would you assess their quality according to the following scales?

	Not at all novel 1	2	3	4	5	6	Extremely novel 7
1. Novelty	❒	❒	❒	❒	❒	❒	❒
	Not at all radical 1	2	3	4	5	6	Extremely radical 7
2. Assumed radicalness	❒	❒	❒	❒	❒	❒	❒
	Of no consequence at all 1	2	3	4	5	6	Of very great consequence 7
3. Assumed magnitude	❒	❒	❒	❒	❒	❒	❒
	Not at all effective 1	2	3	4	5	6	Extremely effective 7
4. Assumed effectiveness	❒	❒	❒	❒	❒	❒	❒

Please indicate to what extent **your team implemented** the ideas concerning the following aspects of work.

My team implements:	No new ideas implemented 1	2	3	4	5	6	Many new ideas implemented 7
1. new targets or objectives	❒	❒	❒	❒	❒	❒	❒
2. new methods to achieve work targets	❒	❒	❒	❒	❒	❒	❒
3. new working methods or techniques	❒	❒	❒	❒	❒	❒	❒
4. new information or recording systems	❒	❒	❒	❒	❒	❒	❒
5. new products or product improvements	❒	❒	❒	❒	❒	❒	❒
6. new processes	❒	❒	❒	❒	❒	❒	❒
7. other aspects of work	❒	❒	❒	❒	❒	❒	❒

When you think about **your team's implemented ideas**, how would you assess their quality according to the following scales?

	Not at all novel 1	2	3	4	5	6	Extremely novel 7
1. Novelty	❒	❒	❒	❒	❒	❒	❒
	Not at all radical 1	2	3	4	5	6	Extremely radical 7
2. Radicalness	❒	❒	❒	❒	❒	❒	❒
	Of no consequence at all 1	2	3	4	5	6	Of very great consequence 7
3. Magnitude	❒	❒	❒	❒	❒	❒	❒
	Not at all effective 1	2	3	4	5	6	Extremely effective 7
4. Effectiveness	❒	❒	❒	❒	❒	❒	❒

DEMOGRAPHIC INFORMATION

Gender:
Female (1)
Male (2)

Country:

Age:
20 up to 30
30 up to 40
40 up to 50
50 up to 60
60 or more

Education level:
Professional High School (1)
High School (2)
College degree (3)
University degree (4)
Master's Degree (5)
PhD (6)

How many years have you been working for this company?
0-1
1-3
3-5
5-10
more than 10

How many years have you been working in the position of team leader?
0-1
1-3
3-5
5-10
more than 10

How many years have you been working with your current team (in this constellation)?
0-1
1-3
3-5
5-10
more than 10

Your job is:
Full-time (1)
Part-time (2)

How many teams do you supervise?
1 2 3 4 5 more than 5

Appendix D: Team leader questionnarie (Slovenian)

Pred vami je vprašalnik "*Večnivojski pristop k preučevanju mikro-osnov timskih inovacij*. S pomočjo vprašalnika bi rada pridobila boljši vpogled v inovativne procese zaposlenih. Vaši odgovori bodo strogo zaupni in anonimni. Rezultati raziskave bodo objavljeni samo v agregatni obliki in posamezni odgovori ne bodo razvidni. Prav tako ni pravilnih ali napačnih odgovorov. V kolikor naletite na težave pri izpolnjevanju vprašalnika vas prosim, da me kontaktirate preko e-pošte: jana.krapez@ef.uni-lj.si.

Že vnaprej se najlepše zahvaljujem za vaše sodelovanje v raziskavi.

Za začetek izpolnjevanja vprašalnika, prosim kliknite na spodnji gumb "Start".

1. Kot vodja prosim izberite svoje ime.

2. Vprašalnik vključuje 29 izjav o vaših osebnih in timskih lastnostih, prepričanjih in vedenju ter vam bo vzel približno 5 min da ga izpolnite. Prosimo, da svoje mnenje o vsaki izjavi izrazite z izbiro enega izmed podanih odgovorov, ki najbolje opisuje vaš prepričanje ali občutje. Prosimo vas za odkritost pri opisu sebe in svoje ekipe in da podate mnnje o tem kakšni ste v realnosti in ne kot bi želeli biti.

Razmišljajte o VAŠEM ODNOSU S ČLANI VAŠEGA TIMA.

Odnos vodja-zaposleni na timskem nivoju				
Ali vaš član običajno ve, kako zadovoljni ste z njegovim delom?				
Redko	Občasno	Včasih	Dokaj pogosto	Zelo pogosto
Kako dobro razumete težave in potrebe pri delu vaših članov?				
Niti malo	Malo	Srednje	Dokaj	Veliko
Kako prepoznate vaš potencial vaših članov?				
Sploh ne	Malo	Zmerno	Večinoma	V celoti
Kakšne so možnosti, da bi uporabil svojo moč, da bi članu vašega tima pomagali rešiti težave pri delu?				
Nikakršne	Majhne	Srednje	Velike	Zelo velike
Kakšne so možnosti, da bi uporabil svojo moč, da bi pomagali članu vašega tima iz težav na svoj račun?				
Nikakršne	Majhne	Srednje	Velike	Zelo velike
Svoje člane bi zagovarjal in opravičil njihovo odločitev, če oni osebno ne bi bil prisotni.				
Močno se ne strinjam	Se ne strinjam	Nevtralen	Strinjam se	Močno se strinjam
Kako bi opisali svoj delovni odnos s članom vašega tima?				
Izjemno neučinkovit	Slabši od povprečja	Povprečen	Boljši kot v povprečju	Izredno učinkovit

V kolikšnem obsegu VAŠ TIM GENERIRA NOVE IDEJE glede na naslednje vidike dela.

Moj tim generira ideje za...	Nič novih generiranih idej 1	2	3	4	5	6	Veliko novih generiranih idej 7
1. nov cilji	❒	❒	❒	❒	❒	❒	❒
2. nove metode za doseganje ciljev	❒	❒	❒	❒	❒	❒	❒
3. nove delovne metode in tehnike	❒	❒	❒	❒	❒	❒	❒
4. novi podatki ali sistemi za spremljanje	❒	❒	❒	❒	❒	❒	❒
5. novi produkti ali izboljšave produktov	❒	❒	❒	❒	❒	❒	❒
6. novi procesi	❒	❒	❒	❒	❒	❒	❒
7. drugi aspekti dela	❒	❒	❒	❒	❒	❒	❒

Ko razmišljate o GENERIRANIH IDEJAH V VAŠEM TIMU, kako bi ocenili njihovo kvaliteto glede na spodnje lestvice?

	Nobenih novitet 1	2	3	4	5	6	Veliko novitet 7
1. Noviteta	❒	❒	❒	❒	❒	❒	❒
	Nikakršna radikalnost 1	2	3	4	5	6	Zalo radikalno 7
2. Domnevna radikalnost	❒	❒	❒	❒	❒	❒	❒
	Popolnoma brez posledic 1	2	3	4	5	6	Z velikimi posledicami 7
3. Domnevna magnituda	❒	❒	❒	❒	❒	❒	❒
	Popolnoma neučinkovita 1	2	3	4	5	6	Zelo učinkovita 7
4. Domnevna učinkovitost	❒	❒	❒	❒	❒	❒	❒

V kolikšnem obsegu je VAŠ TIM IMPLEMENTIRAL IDEJE glede na naslednje vidike dela.

Moj tim je implementiral:	Nobena nova ideja ni implementirana 1	2	3	4	5	6	Veliko novih idej implementiranih 7
1. nov cilji	❒	❒	❒	❒	❒	❒	❒
2. nove metode za doseganje ciljev	❒	❒	❒	❒	❒	❒	❒
3. nove delovne metode in tehnike	❒	❒	❒	❒	❒	❒	❒
4. novi podatki ali sistemi za spremljanje	❒	❒	❒	❒	❒	❒	❒
5. novi produkti ali izboljšave produktov	❒	❒	❒	❒	❒	❒	❒
6. novi procesi	❒	❒	❒	❒	❒	❒	❒
7. drugi aspekti dela	❒	❒	❒	❒	❒	❒	❒

Ko razmišljate o IMPLEMENTACIJI IDEJ v VAŠEM TIMU, kako bi ocenili njihovo kvaliteto glede na spodnje lestvice?

	Nobenih novitet 1	2	3	4	5	6	Veliko novitet 7
1. Noviteta	❒	❒	❒	❒	❒	❒	❒
	Nikakršna radikalnost 1	2	3	4	5	6	Zalo radikalno 7
2. Domnevna radikalnost	❒	❒	❒	❒	❒	❒	❒
	Popolnoma brez posledic 1	2	3	4	5	6	Z velikimi posledicami 7
3. Domnevna magnituda	❒	❒	❒	❒	❒	❒	❒
	Popolnoma neučinkovita 1	2	3	4	5	6	Zelo učinkovita 7
4. Domnevna učinkovitost	❒	❒	❒	❒	❒	❒	❒

DEMOGRAFSKI PODATKI

Spol:
Ženski (1)
Moški (2)

Starost:
20-30
30-40
40-50
50-60
60 ali več

Stopnja izobrazbe:
Poklicna srednja šola (1)
Gimnazija (2)
Visoka šola ali specializacija (3)
Univerzitetna izobrazba (4)
Magistrska izobrazba (5)
Doktorat (6)

Koliko let ste že zaposleni na tem podjetju?
0-1
1-3
3-5
5-10
več kot 10

Koliko let ste že zaposleni na delovnem mestu vodje?
0-1
1-3
3-5
5-10
več kot 10

Koliko let že sodelujete s svojim timom?
0-1
1-3
3-5
5-10
več kot 10

Vaša zaposlitev je:
Polni delovni čas (1)
Polovični delovni čas (2)

Koliko timov vodite (nadzirate)?
1 2 3 4 5 več kot 5

Appendix F: Summary in Slovenian language (Daljši povzetek disertacije v slovenskem jeziku)

Inovativnost je v literaturi izpostavljena kot eden izmed najpomembnejših procesov, saj vodi k boljši kakovosti življenja za širšo družbo. Ali bo organizacija preživela, ali bo uspešna ter učinkovita v današnjem zahtevnem poslovnem okolju postaja vedno bolj odvisno od inovacij (Amabile, 1993; Anderson & King, 1991; Baer & FRESE, 2003; Bledow, FRESE, Anderson, Erez, & Farr 2009; Choi & Chang, 2009; Prahalad & Krishnan, 2008; Škerlavaj, Song, & Lee, 2010), saj le te predstavljajo temelj ekonomskega vedenja (Ancona & Caldwell, 1987; Crossan & Apaydin, 2010; Mansury & Ljubezen, 2008 ; Schumpeter, 1934; Scott & Brouce, 1994).

Kljub temu, da so akademiki, podjetja in vlade priznali pomen inovaciji za organizacijo, je premalo pozornosti namenjene timom in njihovemu vplivu na promocijo oziroma zaviranje inovacij (npr. Anderson & West, 1998; Drach-Zahavy & Somech, 2001; Eisenbeiss, van Knippenberg, & Boerner, 2008; Somech & Drach-Zahavy, 2011). Raziskovalci s področja inovacij v zadnjih letih trdijo, da situacijski in osebnostni elementi močno prispevajo k timski inovativnosti (Taggar, 2002). Timska inovativnost žal ne more nastati brez njenega najpomembnejšega dejavnika, to je ustvarjalnosti (Amabile, 1988). Konstrukt ustvarjalnosti, ki vključuje generiranje novih in uporabnih idej, je nujen, čeprav ne zadosten, predhodnik inovacij. Inovacije vključujejo poleg generacije idej tudi zadnjo fazo in sicer implementacijo ustvarjalnih idej (Amabile, 1988).

Ti mikro in mezo-analitični vplivi so izredno pomembni za generacijo in implementacijo vsake ideje na organizacijski ravni (Anderson & King, 1993; Hulsheger, Anderson & Salgado, 2009; Shalley & Gilson, 2004) tudi zaradi njene družbeno-politične dimenzije (Maute & Locander, 1994). Ko se inovativna ideja pretvori iz faze generiranja v fazo implementiranja idej je tim tisti, ki s svojim trudom potiska, spreminja ali opusti posamezno idejo (Shalley, Zhou, in Oldham, 2004; Van de Ven 1986; West, 2002). Drach-Zahavy in Somech (2001, str.1) sta inovacijo opredelila kot "*interaktiven proces med ljudmi, strukturami in procesi*". Zato je za razumevanje, kako spodbujati timske inovacije, potrebno sočasno preučiti osebnosti in procese posameznih članov in to v okviru tima.

Inovativnost je v zadnjih letih postala ena izmed najbolj vročih tem v menedžment literaturi in brskanje izraza "inovacija" v Google Učenjak zagotavlja več kot 3,1 milijona zadetkov, kar dokazuje njeno izjemno priljubljenost. West in Farr (1989, str.16) sta inovacijo opredelila kot "*namerno uvedbo in uporabo idej, postopkov ali izdelkov znotraj skupine ali organizacije, ki so namenjeni za pridobivanje znatnih koristi iz uspešnosti skupine, organizacije ali širše družbe*". Inovativnost kot proces je interaktivni pretok različnih prispevkov v okviru posameznih faz.

Doktorska disertacija z uporabo več-nivojskega pristopa na dveh ravneh raziskovanja (posameznik in skupina) prispeva k poglobljenemu razumevanju področja timskih inovacij. Z namenom prispevati k širšemu raziskovalnemu področju inovativnosti, sem svoje raziskovanje gradila na več-nivojski teoriji (Kozlowski & Klein, 2000) in se osredotočila na neotipljivo vsebino inovativnosti, njen kontekst in najpomembnejše dejavnike. Ob tem sem še dodatno poudarila vlogo posameznika znotraj skupine.

Organizacije, temeljijo na interakcijskih nivojih (kot so oddelki, skupine in posamezniki) z določeno stopnjo medsebojne odvisnosti, ki posledično vodi do »spodaj-navzgor« in »zgoraj-navzdol« vplivnih mehanizmov (Costa et al., 2013). Več-nivojski modeli so statistični modeli parametrov, ki se razlikujejo na več kot eni ravni. Modeli na več ravneh so se v literaturi uveljavili pod različnimi imeni, kot so npr. »*naključni koeficient modela*« (De Leeuw-Kreft, 1986); »*variantni komponenti model*« (Longford, 1987) in »*hierarhični linearni model*« (Raudenbush & Bryk, 1986). Vsi modeli v moji disertaciji predpostavljajo, da obstaja hierarhičen niz podatkov, z eno samo odvisno spremenljivko, ki je merjena na ravni tima in pojasnjevalnih (neodvisnih) spremenljivk na individualni in timski ravni.

Kozlowski in Bell (2003, str.7) trdita, da se »*timi ne vedejo, temveč da se posamezniki vedejo; ki pa to storijo na način, da ustvarjajo pojave na ravni tima*«. Posamezniki so ugnezdeni znotraj tima in timi so v zameno povezani in ugnezdeni v organizacijo. To hierarhično gnezdenje, ki je značilno za organizacijske sisteme, zahteva uporabo več-nivojskega pristopa za razumevanje in raziskovanje timskih pojavov (Kozlowski & Bell, 2003).

Obstoječe raziskave so v splošnem razdeljene na timsko in na posameznikovo raven, kjer vsak nivo predstavlja območje različnih teorij in metod. Akademiki s področja psihologije se pogosto osredotočajo na mikro raziskave, raziskovalci z organizacijskega vidika pa se posvečajo bolj makro pristopu (Mathieu & Chen, 2011). Mezo-nivo je bil tako v veliki večini raziskovalno področje socialnih psihologov, ki se strinjajo da je bil vsak pojav preučevanja pod vplivom učinkov iz zgornjih in spodnjih nivojev.

Mikro-makro razkorak je jasno viden na področju timskih inovacij, kjer se mikro raziskave močno zanašajo na druge discipline (npr. psihologijo). Literatura s področja organizacijskega vedenja in psihologije večinoma prispeva k raziskavam inovacij s preučevanjem ustvarjalnosti, motivacije, sposobnosti in priložnosti za inovacije na individualnem in/ali timskem nivoju (Amabile, 1988; Baer, 2012). Inovativnost je torej pojav na individualni ravni, ki se lahko agregira na višjo raven v okviru primernih pogojev.

Individualno inoviranje je temelj za skupinsko (timsko) inoviranje. Obsežen del literature je potrdil dejavnike, ki delujejo kot spodbujevalci inovacij. Štirje ključni dejavniki so bili potrjeni kot predhodniki delovnih vlog inovacij na individualni ravni analize: osebnost (Barron in Harrington, 1981; George & Zhou, 2001, West & Wallace, 1991), motivacija (Amabile, 1983), kognitivna sposobnost (Barron in Harrington, 1981), in razpoloženje (George & Zhou, 2002).

Že v prvih študijah na temo inovacij so znanstveniki domnevali, da nekatere osebnostne značilnosti predstavljajo potencial posameznika za inoviranje (Barron & Harrington, 1981). Raziskave so potrdile povezavo med agregatno osebnostjo članov tima in uspešnostjo tima (Moreland & Levine, 1992). Čeprav se zdi, da je timska osebnostna kompozicija relativno robusten napovedovalec uspešnosti, raziskave kažejo, da so lahko različne kompozicije bolj ali manj učinkovite glede na nalogo in vsoto interakcij članov, ki so potrebne za učinkovito doseganje rezultatov tima (Kozlowski in Bell, 2003).

Generacija idej na individualni ravni zagotavlja temelje za inovacije tako posameznikov kot tudi skupin. Podjetja lahko veliko pridobijo z razumevanjem načina zagotavljanja inovacij iz generiranja idej, saj je implementacija ustvarjalnih idej zadnji korak, ki pa zagotavlja oprijemljivo vrednost za organizacijo (Baer, 2012). Temelj vseh inovacij je torej kreativna ideja,

ki je posledica ustvarjanja, spodbujanja, razpravljanja, spreminjanja in uresničitve teh idej s strani posameznikov ali skupine (Van de Ven, 1986).

Tako je glavni raziskovalni namen moje disertacije kot celote pojasniti razumevanje mikro-temeljev kot močnega orodja produktivnosti timskih inovacij s pomočjo modelov pojava (od tu dalje »emergence«), ki bo spodbudilo in vodilo raziskave na več ravneh. Z namenom prispevanja k širšemu področju inovacij, sem izhajala iz več-nivojske teorije (Kozlowski in Klein, 2000) in se osredotočila na prednostne mikro-osnove, in kako lahko le te pomagajo ustvariti bolj produktivne inovacije v timih in bolj učinkovite posameznike.

Obsežen del literature je posvečen ustvarjalni osebnosti, raziskovalci pa so manj pozornosti namenili različnim stilom mišljenja in vedenju ter občutkom članov tima, ki so pomembni za implementacijo ideje na timski ravni in ne zgolj za generiranje idej. Zato sem se v prvem poglavju poglobila v literaturo in na podlagi obstoječih ugotovitev poskušala opredeliti katere karakteristike so pomembne za inovativnost na nivoju posameznika in/ali tima. Rezultat dela je bil kvalitativni pregled literature in odkritje ključnih področji raziskovanja znotraj literature o mikro-osnovah timske inovativnosti na ravni posameznika in analiza njihovega pomena za timsko inovativnost.

V drugem poglavju sem na podlagi ugotovitev iz prvega poglavja preučevala so-vpliv intuicije in potrebe po spoznanju na uspešnost posameznih faz timskih inovacij. Kot statistično metodo analize podatkov sem uporabila hierarhično multivariacijsko regresijo in preverila rezultate z modelom karakteristik posameznika in njihovim vplivom na timsko inovativnost. To sem storila na podatkih, zbranih od 249 zaposlenih v štirih podjetjih iz dveh držav: Slovenije in Nemčije. Rezultati so izpostavili in potrdili ugotovitve literature, da sta timska intuicija in potreba po spoznanju pozitivno in statistično značilno povezane s timskimi inovacijami. Poleg tega je moja raziskava pokazala, da obstaja močnejša povezava med intuicijo in timsko generacijo idej na eni strani in potrebo po spoznanju in timsko implementacijo idej na drugi strani. Rezultati in oblika interakcije so pokazali, da je bil najvišji nivo timskih inovacij dosežen, ko so bili zaznani visoki nivoji timske intuicije in potrebe po spoznanju.

V tretjem poglavju sem predstavila in razložila rezultate predhodnih raziskav o razmerju med zaznavami timske intuicije, potrebe po spoznanju in psihološke varnosti v napovedih uspešnosti prve faze timskih inovacij – generacije idej. Regresija na timskem nivoju zahteva uporabo agregiranih rezultatov zato sem agregirala posameznikovo percepcijo timskih intuicij, potrebe po spoznanju in psihološko varnost na timski nivo. Rezultati so potrdili ugotovitve literature, ki trdi da je intuicija pozitivno in statistično značilno povezana z generacijo idej. Hkrati rezultati podpirajo trikratno interakcijo posameznikovih percepcij intuicije, potrebe po spoznanju in psihološki varnosti v razmerju do timskega nivoja generiranja idej. Rezultati in oblika interakcije so pokazali, da so bili najvišji nivoji generiranja idej v timih doseženi, ko so bili zaznani visoki nivoji timske intuicije. Poleg tega so timi zaznali visoke nivoje potrebe po spoznanju in psihološke varnosti. Ti rezultati potrjujejo, da delujejo več-nivojske sile v procesu generiranja idej.

V četrtem poglavju sem preučevala mikro-osnove timske inovativnosti na ravni posameznika. Na osnovi teorije sposobnosti-motivacije-priložnosti sem preučevala medsebojni vpliv proaktivne osebnosti članov tima (sposobnosti), kolektivnega opolnomočenja (motivacija), in podpore vodje (priložnost), ter njihov medsebojni vpliv pri napovedovanju uspešnosti timskih inovacij. Rezultati študij v podjetjih so pokazali, da je kolektivno opolnomočenje pozitivno povezano s timskimi inovacijami. Vendar je bil učinek kolektivnega opolnomočenja na timsko inoviranje šibkejši, ko je tim prejel visoko raven podpore vodje in je proaktivnost moderirala ta odnos. Ko so timi zaznali nižjo raven kolektivnega opolnomočenja, sta bila timska proaktivnost in podpora vodje bolj pomembna za doseganje višjih stopenj timskih inovacij kot so bili, ko so timi zaznali nižjo stopnjo motivacije.

Eden od pomembnejših prispevkov disertacije k literaturi timske inovativnosti je, da prikaže kako posamezni mikro-nivojski predhodniki vplivajo na uspešnost timskih inovacij. Disertacija postavi temelje in okvirje več-nivojskega pristopa za preučevanje procesa timskih inovacij. Takšen pristop zagotavlja bolj podrobno razlago razmerja med posameznikom in timom pri razumevanju inovacijskih procesov. Disertacija ponudi dodatne empirične dokaze s področja osebnostne in inovacijske literature in spoznanja, kako spodbuditi timsko inovativno vedenje.

V prvem poglavju sem s pomočjo sistematičnega pregleda literature ugotovila predhodnike timskih inovacij in jih empirično testirala na individualni in timski ravni v drugem, tretjem in četrtem poglavju. Vse ugotovitve empirično podpirajo teoretsko osnovo iz poglavja 1, ki zagovarjajo pomembnost mikro-osnov za uspešnost timskih inovacij.

Drugi pomemben prispevek mojega dela je nadgraditi predhodne ugotovitve na področju razvoja več-nivojske teorije in timskih inovacij. Več-nivojski pristop, ki združuje mikro in mezo stališča, generira bolj celovito podobo in znanje (Kozlowski & Klein, 2000) s področja timskih inovacij. Z osredotočanjem na pojave timskih inovacij in njihovih predhodnikov, prispevam k nadgradnji znanja timske inovativnosti, ki je bogato v teoriji in pomembno za prakso. Največja prednost uporabe takšne teorije je za akademike, ki so naučeni, da vedno razmišljajo o enem nivoju - posameznik ali skupina, vendar ne o več ravneh naenkrat - individualni in skupinski (Kozlowski in Klein, 2000).

Disertacija dodatno prispeva k več-nivojski literaturi z uporabo emergent konstruktov na individualni ravni za dosego rezultata na ravni tima. Morgeson in Hofmann (1999) sta predlagala, da lahko emergent konstrukti (npr. timska osebnost) nastanejo iz različnih virov, vendar ohranijo podobne pomene konstruktov iz nižjih ravni. Emergent konstrukti, ki izvirajo iz psiholoških značilnosti in interakcij med posamezniki so temeljni dinamičen proces v več-nivojski teoriji. Vsa agregirana nivojska merila, ki sem jih uporabila v disertaciji, so bila agregirana na raven tima kot emergent konstrukt, in vsa so pokazala dovolj močen medsebojni dogovor članov, kar upravičuje agregacijo ocen znotraj posamezne enote na raven enote (Chen et al., 2005). Odkrivanje relativno visokih in značilnih rezultatov ICC(1) nakazuje, da je variabilnost manjša znotraj skupin kot med skupinami.

Kot omenjeno, timska intuicija, percepcija timske psihološke varnosti, kolektivna učinkovitost in podpora vodstva se porajajo kot skupen »referent-shift« konstrukt (Chan, 1998; Chen et al, 2005) in se lahko merijo s pomočjo zbranih agregiranih rezultatov članov tima. Timsko potreb po spoznanju se lahko opredeli s pomočjo »summary index model« (Chen et al., 2005), v katerem je konstrukt na ravni tima opredeljen kot povprečje individualnih značilnosti in timska proaktivnost je agregirana kot »consensus« konstrukt (Chan, 1998; Chen et al, 2005;. Williams et al, 2010), saj ohranja enak pomen ne glede na nivo analize, in temelji na posamezniku kot konstruktnemu

referentu. Z disertacijskim modelom sem prikazala katere mikro-osnove (med intuicijo, potrebo po spoznavanju, kolektivnem opolnomočenju, proaktivnostjo in psihološko varnostjo) so najbolj pomembne v kontekstu uspešnosti timskih inovacij.

Tretji teoretični prispevek moje disertacije kot celote je premostitev disciplinske vrzel med organizacijskim vedenjem, psihologijo in menedžmentom inovacij. To je razvidno v vseh poglavjih, na individualni in timski ravni, kjer sem združila ločena raziskovalna področja osebnosti in inovacij z namenom prispevati k preiskavi njunega medsebojnega razmerja. To vrzel sem v drugem in tretjem poglavju premostila z oporo na Kognitivno-doživljajsko lastno-teorijo (CEST), ki izvira iz področja psihologije. V četrtem poglavju pa sem se osredotočila na model sposobnosti, motivacije in priložnosti (AMO) z namenom razlage rezultatov timskih inovacij z vidika upravljanja.

Poleg emergence individualnega nivoja konstrukta na timsko raven konstrukta, rezultati nakazujejo, da igrajo kontekstualni dejavniki, ki vplivajo na mikro-osnove pomembno vlogo pri zagotavljanju uspeha timskih inovacij. Člani ekipe pogosto sledijo svojim vodjem in pogosto poosebijo njihove pristope in vedenje. Vodje lahko z zagotavljanjem podpore in odstranjevanjem ovir povečajo uspeh inovacij. Rezultati raziskave nakazujejo, da je lahko podpora vodje posebej pomembna v kombinaciji z visoko proaktivno osebnostjo, kar prestavlja »ugodno« delovno okolje.

Dodaten prispevek moje disertacije je povezan z njenim obsegom. Na podlagi Rousseau (1985) sem sledila okviru več-nivojske raziskave in opisala različne nivoje teorije, merjenja in analize v vseh poglavjih dela. To omogoča bolj natančno oceno proučevanih konstruktov in preprečuje zmote na različnih ravneh analize. Pripravila sem opredelitev opazovanih konstruktov na obeh ravneh in jih zavestno preučevala ločeno na različnih ravneh, da ne bi prišlo do teoretične napake.

Za upoštevanje ustreznih nivojev meritev in analiz, sem uporabila obstoječe vprašalnike, ki ne vključujejo elementov iz različnih nivojev, saj bi to lahko ogrozilo njihovo veljavnost konstrukta (Mathieu & Chen, 2011). Osebnostne faktorje (npr. intuicijo, percepcijo psihološke varnosti)

sem preučila na ravni posameznika kot tudi na ravni skupine. Z uporabo več-nivojske perspektive sem poskušala uporabiti mikro in mezo raziskavo inovacij.

Z uporabo ustreznega analitičnega pristopa, ki upošteva odvisnost med enotami na nižji ravni, njihovo gnezdenje in emergence (Mathieu in Chen, 2011) sem preučevala odnose na obeh ravneh. Poleg tega sem izračunala rwg-ocene, ki služijo za določanje sporazuma znotraj tima in dopolnilne ocene zanesljivosti notranjega sporazuma, ki temeljijo na ANOVA metodi (Bliese, 2000). Multivariatna hierarhična regresijska analiza namreč ponuja več možnosti za testiranje različnih vidikov več-nivojskih modelov. To je različica osnovne multivaritne regresijske analize, ki omogoča, določitev fiksnega reda vnosa spremenljivk, z namenom nadziranja učinkov spremenljivk ali testiranja učinkov posameznih prediktorjev neodvisnih od vpliva drugih. Dodaten prispevek dela je torej tudi dosledna empirična analiza. Uporaba primarnih podatkov in hierarhične regresijske analize, moderacijske analize, dogovora, veljavnosti, in analize zanesljivosti na posameznikovi in timski ravni zagotavlja empiričen prispevek, ki doprinese k veljavnost mojega sklepanja.

V vsakem poglavju sem izpostavila posamezna priporočila za prakso, ki so oprijemljiva in pomembne za menedžerje tudi zaradi svoje nazornosti. Vendar pa disertacija kot celota ponuja tudi nekatera krovna priporočila za prakso. Menedžerji se pogosto soočajo z vprašanjem: Zakaj je inovacije tako težko implementirati?

Menedžerji se velikokrat ne zavedajo, kaj natančno morajo storiti, da bi dosegli čim večji uspeh timskih inovacij. Eden od glavnih razlogov je, da mnogi izmed njih ne razumejo pomena različnih osebnosti, ki so potrebne za ustvarjanje in delovanje inovativnega in uspešnega podjetja. Vodje morajo spodbujati svoje člane tima, da delijo svoje poglede znotraj tima, da sodelujejo v timskem delu in nudijo pomoč za spodbujanje inovacij znotraj tima, oddelka ali organizacije. V splošnem, osebnostni elementi članov ekip so značilni vzorci mišljenja, občutenja in delovanja, ki naj bi vplivali na timske inovacije skozi različne procese - od tega kako člani ekipe pristopijo k dokončanju zadolžitve pa do tega kako med seboj sodelujejo.

V disertaciji sem se osredotočila na intuicijo, potrebo po zaznavanju, kolektivnem opolnomočenju, dojemanje psihološke varnosti, in proaktivno osebnost. Disertacija pomaga pri reševanju tega problema, saj omogoča boljšo predstavo o timskih inovacijah.

In ne nazadnje, pomembno priporočilo za prakso je, da sem opisala tako vsebinske iztočnice, ki so pomembne za proces timskih inovacij kot tudi mikro-nivojske osnove. To menedžerjem pomaga pri planiranju implementiranja timske inovativnosti, kaj točno to predstavlja, in do kakšnih rezultatov lahko pripelje, če je pravilno izvedeno. Ugotovitve disertacije prikažejo menedžerjem kaj se lahko zgodi, kadar intervenirajo na primer z izražanjem visoke podpore novim idejam, z zaposlovanjem ljudi s specifičnimi osebnostmi, ali z zagotavljanjem okolja v katerem se zaposleni počutijo varne.

Čeprav sem v nalogi izpostavila več omembe vrednih prispevkov, je pomembno poudariti tudi nekatere omejitve. Ena od omejitev te disertacije so presečni podatki, saj so bili zbrani s preučevanjem posameznikov in timov v istem trenutku, ne glede na razlike v času in ker nimam eksperimentalnih podatkov ne morem predstaviti naključnih trditev (Antonakis et al., 2010).

Kljub dejstvu, da sem empirično testirala in citirala več študij, ki podpirajo moje hipoteze, bi morali rezultate obravnavati previdno zaradi manjše velikost vzorca. Zato je potrebno zanesljivost modelov in njihovo sposobnost za dopolnitev in razširitev obstoječih teorij preizkusiti v obsežnejši študiji, ki vključuje tudi države izven Srednje Evrope. Da bi pravilno in natančno preizkusili več-nivojski model z vsemi medsebojnimi odnosi je potreben vzorec več podjetij in njihovih zaposlenih s timi iz držav iz vsega sveta. To bi predstavljalo širok raziskovalni program, ki pa presega obseg mojega dela.

Četudi imajo timske in posamezne spremenljivke, ki jih preučujem v delu (npr, intuicija, potreba po zaznavanju, psihološka varnost, učinkovitosti, proaktivna osebnost in podpora vodstva) pomemben vpliv na timske inovacije, se zavedam da so tudi drugi dejavniki, ki jih nisem vključila v raziskavo vendar lahko vseeno vplivajo na rezultate inovativnosti na ravni tima. Na primer, v raziskavo nisem vključila drugih osebnostnih značilnosti (npr. stopnje strinjanja in vestnosti) in dejavnikov na ravni tima, ki lahko vplivajo na ta odnos (npr. izmenjava med vodjo

in člani tima na timski ravni, vplivne taktike). Tako je potrebna dodatna raziskava, ki gradi na prvotnem več-nivojskem modelu timskih inovacijskih procesov, in vključitvi dodatnih potencialnih dejavnikov, ki spodbujajo inovativnost na različnih ravneh analize. Moja disertacija spada predvsem v znanstveno področje organizacijskih vedenjskih študij, in se posledično nisem posvečala temam, ki so povezane s tehnološkim inovacijam in so bolj industrijske narave.

Ta disertacija poudarja pomen sklicevanja na več-nivojsko teorijo za raziskave na področju timskih inovacij in ob upoštevanju več-nivojske perspektive preučevanja njene vsebine, konteksta in predvidevanja. Nobena eno-nivojska perspektiva ne more tako ustrezno predstaviti organizacijskega vedenja, ki predstavlja osnovo za timsko inoviranje. Makro vidik zanemarja načine, s katerimi posameznikovo obnašanje in dojemanje sprožijo višje ravni timskih inovacij.

Na podlagi moje disertacije lahko trdim, da bi morali imeti prihodnji teoretični in/ali empirični modeli timskih inovacij koristi od preučevanja na več ravneh. Ta pristop zmanjšuje vrzel iz različnih disciplin in omogoča vpogled in napredek iz različnih vidikov. S praktičnega vidika, bi morali imeti menedžerji in organizacije koristi iz bolj natančnega razumevanje posameznih in kontekstualnih vplivov pri vzpostavljanju pozitivnega poslovnega okolja, ki lahko odločilno prispeva k spodbujanju inovacij na ravni tima.