

**POLITECNICO DI MILANO**

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**POLITECNICO**  
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From shared to dual leadership: a systematic literature  
review and an empirical analysis about how to lead  
innovation in two

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*Federica e Giulia*

## Abstract

In the current, constantly evolving, economic context an essential element that every organization must develop in order to create and maintain a competitive advantage is innovation. Sources of innovation are multiple and can be found both internally and externally to the organization itself.

The present paper aims to investigate working in pairs as a particular source for radical innovation, highlighting at the same time the dynamics according to which two people, even unknown to each other, decide to develop together an innovative project and to therefore constitute a couple of innovators. The paper comprises of a first part of Systematic Review of the literature aimed at outlining the current state of research on shared leadership and dual leadership: at the end of the Systematic Review, a theoretical reference model built from the specific literature is proposed for each of the two leadership styles. The second part of the paper aims to answer the research gaps and research questions that emerged from the literature analysis. This is made possible by the use of a database of couples of innovators, built by Politecnico di Milano in collaboration with the Lombardy Region.

The main results of the thesis are the extrapolation of three variables (Maturity of the Relationship, Entity Type and Complementarity of Competencies) essential for understanding the formation process of couples and the formulation of important points of reflection related to the connection between couples and innovation, starting from the intersection of the aforementioned three variables.

## **Abstract – Italian version**

Nell'attuale contesto economico, in continua evoluzione, un elemento essenziale che le organizzazioni devono sviluppare al fine di creare e mantenere un vantaggio competitivo è l'innovazione. Le fonti dell'innovazione sono molteplici e possono essere ritrovate sia internamente che esternamente alla organizzazione stessa.

Il presente elaborato si propone di indagare il lavoro di coppia come una particolare fonte per l'innovazione radicale, evidenziando al tempo stesso le dinamiche secondo le quali due persone, anche sconosciute tra di loro, decidono di sviluppare insieme un progetto innovativo e di formare dunque una coppia di innovatori.

L'elaborato consta di una prima parte di revisione sistematica della letteratura volta a delineare lo stato attuale della ricerca sulla leadership condivisa e sulla leadership duale: al termine della revisione sistematica, per ciascuno dei due stili di leadership viene proposto un modello teorico di riferimento supportato dalla relativa specifica letteratura.

La seconda parte dell'elaborato si propone di rispondere ai gap e alle domande di ricerca emerse dall'analisi della letteratura attraverso l'uso di un database di coppie di innovatori, costruito dal Politecnico di Milano in collaborazione con Regione Lombardia.

I principali risultati della tesi sono l'estrapolazione di tre variabili (Maturità della Relazione, Tipo di Realtà Innovativa e Complementarietà delle Competenze) essenziali alla comprensione del processo di formazione delle coppie e la formulazione di importanti punti di riflessione relativi alla rapporto tra coppie e innovazione a partire dall'intersezione delle tre variabili sopracitate.

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### Executive Summary

The present paper aims to investigate working in pairs as a particular source for radical innovation, highlighting at the same time the dynamics according to which two people decide to develop together an innovative project and therefore to form a couple of innovators.

The first thing we needed in order to perform this kind of investigation was to better frame the concepts of shared leadership and dual leadership within the current state of scientific research. In order to have a complete overview on the state of art research on the topics, we proceeded with a Systematic Review of the literature aimed at identifying: the main authors who wrote about shared and dual leadership, the variables of which the two models are composed, the contexts in which they are used the most and the benefits that they bring in an organization.

After defining two theoretical frameworks for both the leadership styles (shared and dual), we then proceeded with the definition of our empirical research objectives, which were tested on a sample of 50 pairs from a database built by the Milan Polytechnic. Thanks to the empirical analysis made on the sample provided, we have succeeded in fulfilling the objectives identified at the end of the research phase, and we contributed to opening up of new research opportunities in the field of dual leadership applied to innovation.

The thesis consists of two parts that are connected, but at the same time very distinct: a first part deals with Systematic Literature Review while the second part deals with empirical research on the sample of pairs. The first two chapters of the thesis form the Literature Review, while the third chapter is a presentation of the database given to us by the Politecnico di Milano to perform our analysis. The fourth and the fifth chapter illustrate the methodology used for collecting and analyzing the data contained in the database, while the last two chapters are

dedicated to the presentation and commentary of the results obtained by our empirical analysis.

Chapter 1 aims at introducing the concepts of shared leadership, dual leadership and dual leadership linked to innovation. The main objective of this chapter is to give a wide overview of the state-of-art research about the topics that constitute the base for understanding the elaborate we developed. This chapter explains how in the last years, traditional leadership theories, as the hierarchical vertical leadership theory, have been questioned due to the increased complexity of the general work environment. We illustrate that a potential answer to this complexity can be found in the emergence of new leadership models that promote a distributed leadership power and that following the principles of these new theories, companies have already started to organize their work in teams, thus sharing the leadership and the decision making power among the members of the different teams: their belief is that collaboration between members (who fulfill leadership functions) can improve the effectiveness and efficiency of the organization itself.

We also mention that even if shared leadership is a relatively recent topic, several studies have already argued about the effectiveness of the application of the shared leadership in teams in various contexts. Past researches and studies identified team performance improvement as the main outcome of shared leadership, but there are numerous studies that highlight other important outcomes of shared leadership such as creativity (Liang and Gu, 2016, Hu et al., 2017), knowledge creation (Bligh et al., 2006) and innovation (Hoch, 2014). Once we perceived the benefits linked to sharing the leadership power among the members of a team, we decided to direct our attention to another particular leadership style that includes as well the fundamental idea of distribution of power between more than just one individual, namely dual leadership: in particular dual leadership appoints to those situations in which the leadership power is divided only between two members of the team.

Heenan and Bennis in 1999 were the first to write about dual leadership: they provided a definition of it, describing it in terms of two leaders who are positioned equally inside the team and who share the responsibilities of being a leader. Even if the body of literature related to dual leadership is rather limited, it appears from the literature that its application in an organizational context is highly beneficial (Miles and Watkins, 2007; Wilhelmson, 2006; Friedrich, Vessey, Schuelk, Ruark and Mumford, 2009), confirming that dual leadership can be a solution to organizational complexity. The author who focused more on the relationship between dual leadership and innovation is Shenk: according to him, the essence of innovation is rooted in couples of innovators. Shenk's contribution was fundamental in our research as he analyzed in a structured way the phenomenon of creative couples and therefore confirming that couples can be a useful leadership model to investigate, especially when the goal the couple aspires to is to create innovation.

Chapter 1 concludes with a deepening about the concepts of innovation and creativity and about the connection they have between them, but more importantly, it defines the objectives of the first part of the thesis. The objectives of the Systematic Literature Review are:

- to create a theoretical framework about the state of art knowledge related to shared leadership and its possible outcomes, with special attention to one precise outcome, which is innovation and
- to verify if, according to the literature dual leadership can be considered as a variant of the broader concept of shared leadership, that is to say, to verify if it is possible to describe the “couple” entity using as a starting point the same theoretical framework that we created for shared leadership.

Chapter 2 is related to the Literature Review and it can be conceptually divided into two parts: the aim of the first part of the chapter is to illustrate in detail the methodology we went through in order to gather the documents used as the base

for the Systematic Literature Review, while the second part of the chapter is completely dedicated to the illustration of the Systematic Review of the Literature about shared leadership and dual leadership.

The main purpose of creating a pool of selected articles was to have a strong bibliography base, which resulted useful for the following steps of the creation of the theoretical frameworks and of the empiric study of the couples database. The gather of the bibliography was conducted in four main steps:

<b>1</b>	Identification of the objectives of the research	Using as a starting point the existent literature, the objective of the first part of our research is to create a theoretical framework representing the linkage between shared leadership and its outcomes, plus to analyze whether if it is possible to describe the “couple” entity using as a starting point the same theoretical framework.
<b>2</b>	Analysis of the overview generated by the Scopus Database Search	<p>Searching “Shared Leadership” keywords on Scopus:  “Shared Leadership” (all abs, keywords, titles).  <b>Subject areas:</b> Social Sciences, Business Management  <b>Document type:</b> Articles, Book Chapters  <b>Years:</b> from 1950 to 2019  <b>464 documents found</b></p>
<b>3</b>	Filtration of the publications and creation of a “shared leadership” literature database	<p>Evaluation, selection or rejection of the found documents based on the complete reading of the related abstract. We mainly focused on finding articles related to a managerial context but we did not put a strong limitation on the scope of the article so as not to over-restrict the number of documents to use for the subsequent stages of our research.</p> <p><b>110 documents selected</b>  <b>17 documents added analyzing the references of the aforementioned 110</b>  <b>127 documents used as literature base</b></p>
<b>4</b>	Creation and discussion of a first draft of the theoretical framework related to shared leadership and its outcomes	<p>Creation of a theoretical framework that includes all the most important blocks concerning shared leadership and its outcomes.</p> <p>Considerations about the possible expansion of the framework to the dual leadership variant</p>

In reading the papers we realized that often the bodies of the articles are composed simply by an explanation of a theoretical framework exposed to the opening of the article itself. Those theoretical frameworks are usually depicted at the beginning of the article and are organized in a block structure in which each block is connected to another with an arrow. From this fact, we therefore understood that the previous literature, in analyzing shared leadership, followed a specific *modus operandi* that we decided to maintain also in our thesis. Generally, the theoretical frameworks found in the literature are composed of three fundamental blocks:

- Antecedents: refer to all those phenomena that temporally precede shared leadership and that favor its introduction at a team level.
- Moderators: impact on the effect that shared leadership has on the outcomes.
- Outcomes: they vary, but the most studied outcome is the effect that shared leadership has on team performance.

Chapter 2 proceeds with a detailed description of all the Antecedents, Moderators and Outcomes studied in the selected literature base. Below we show a summary table of the variables found in the literature:

Country level	Team level	Leader level	Task level	Environment level
Regulative antecedents	Team environment that supports the development of SL	Encourages SL	Interconnectivity	Support systems
Normative antecedents	External team coaching	Humility	Creativity	Reward systems
Cognitive antecedents	Vertical and empowering leadership	Empowering	Complexity	Cultural systems
	Team member integrity	Fosters collaborative decision making	Criticality	
	Complementarity	Respects competencies	Urgency	
		Provides coaching support		
		Rewards SL		

Table 1: Antecedents of shared leadership

Team level	Task level
Team tenure	Task complexity
Team autonomy	Task interdependence
Low age difference	
Coordination	
Intragroup team trust	

Table 2: Moderators of shared leadership

For what concerns the outcomes, the studied are Team performance, Client Satisfaction, Business innovation, Organizational effectiveness, Firm financial growth, and Innovative culture.

Given the factors that we analyzed and collected during the Systematic Literature Review, we proceeded our analysis with the representation of the theoretical framework which summarizes the composing factors of the dual leadership style, which presents as it follows.

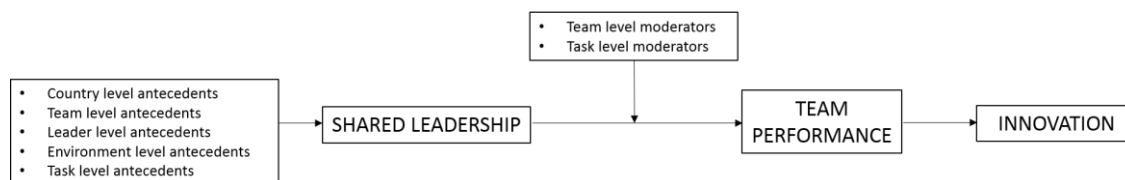


Figure 1: Shared leadership theoretical framework

After the elaboration of the scheme about shared leadership we wanted to verify whether part of the theoretical framework elaborated for shared leadership could work also for the dual leadership style, so we proceeded with the review of the dual leadership literature. Also, the literature about dual leadership has identified some preconditions to dual leadership that can be considered its antecedents: Klinga et al., (2016) identified antecedents in the form of a set of rules that the two co-leaders have to respect if they are willing to work together. Among the

other antecedents, we find: perceiving the management role as a collective activity, being interested in and willing to invest time in collaboration and in learning about each other's responsibilities and being able to compromise.

The literature about dual leadership though did not help us in finding elements that we could easily interpret as moderators of the dual leadership model, thus we could only make hypothesis that we later verified in the second part of the thesis. The scheme about dual leadership is reconnected to the shared leadership's one and expands it. It is presented as it follows:

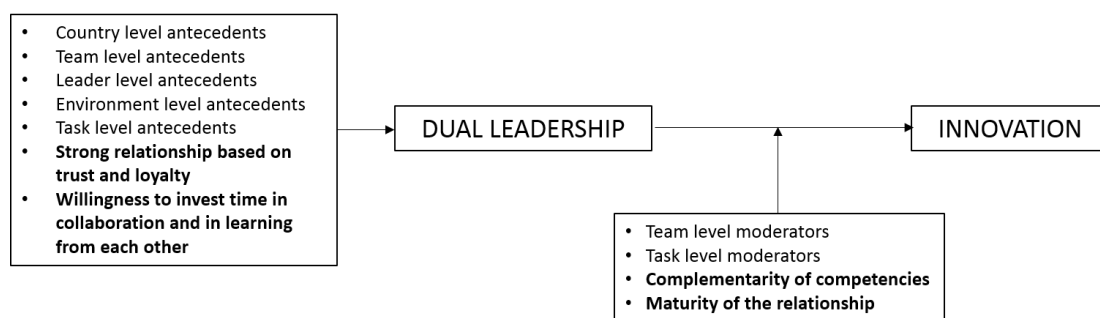


Figure 2: Dual leadership theoretical framework

It is possible to notice that the blocks of the partial scheme concerning shared leadership that we presented in Figure 1 have not been modified, but only integrated with those blocks concerning dual leadership: starting from the reading of the literature, in fact we were able to identify some specific blocks that are related precisely to dual leadership (bolded in the theoretical framework). The fact that the two schemes are composed of the same blocks and that the factors that impact and affect shared leadership can also fit the dual leadership model leads us to say that dual leadership can be considered as a variant of shared leadership.

At this point, we noticed how the theoretical framework of shared leadership is particularly smooth and well-articulated, while the framework that concerns dual leadership had some important gaps, such as the lack in the literature of factors



that can clearly be considered moderators of the relationship between dual leadership and innovation.

This lack of a solid connection between dual leadership and innovation is for us an important literature gap that we believe can be introduced in the shared leadership research agenda, as we have said that dual leadership can be considered a particular variant of shared leadership. We in fact proceeded with a brief presentation of the research agenda that shows what has still to be explored about the topic of shared leadership. We noticed a lack of a universally accepted common definition of shared leadership that leads authors to measure it with many different methods, leading to results that can be unreliable for other authors. Another thing that is missing is a general and structured framework comprehensive of antecedents, moderators and outcomes that gives a complete overview of how shared leadership emerges, develops and produces outcomes. Chapter 2 concludes by stating the research gap found during the literature analysis and the formulation of research proposals for the second empirical part of the thesis.

In the empiric part of the thesis we went deep into the relationship that links dual leadership with innovation in order to precisely:

- enrich the strand of literature that links dual leadership to innovation so as to partially bridge the research gap on the link between dual leadership and innovation.
- investigate whether in our sample of innovative couples Complementarity of Competencies and Maturity of the Relationship can be considered as moderators of the link between dual leadership and innovation.
- understand the dynamics which establish among the members of a couple who decide to undertake a business project together: specifically, we wanted to understand what is the reason that leads a couple to form and to maintain over time and what are the effects of working in pairs on the outcomes.

Chapter 3 introduces the second part of the thesis: in this second empiric part of the thesis, where we aimed to empirically investigate the three points mentioned at the end of Chapter 2.

Chapter 3 is a purely descriptive chapter in which we explain the reasons why we decided to analyze the couples database. The main reason was our conviction that only by analyzing couples empirically could have been possible to fully understand the dynamics that form in the couple and understand the profound motivation for which two people decide to undertake an entrepreneurial adventure together.

So, in order to perform our empiric analysis, we used a database of projects undertaken by couples that was built for the “Genio e Impresa” exhibition held in Milan from July 2019 to September 2019. The database contained the experiences of innovation and other information about 50 couples of innovators, all belonging to the Lombardy Region. The exhibition aimed to answer the question “Where does innovation come from?” and the intuition that the research team of Politecnico di Milano had, and that we investigated with our research, was that innovation, especially the most radical, is born in pairs. Our empirical analysis started with the definition of supplementary information, showed in Chapter 3, added to the database in order to enrich it. We in fact added relevant information regarding the gender of the innovators, information about the age difference between the two members of the couple, the fact of being co-founders of innovative reality or not, about the type of innovative reality (if created) and other important information the background of the members of the couples.

Chapter 4, which comes right after the introduction and the presentation of the information contained in the database of couples, proceeds with the illustration of the methodology that Politecnico di Milano used in order to collect the original database of couples used for the exhibition “Genio e Impresa” and the methodology that we used in order to collect additional data for the database of

couples.

Starting from the work that has been done by Politecnico di Milano, so from the very origin, the database of couples has been built in three separate steps, the first two steps have been undertaken by Politecnico di Milano, while the last one has been undertaken by the authors of this thesis:

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<b>1</b>	Open call launched by Politecnico di Milano
<b>2</b>	Skimming following the criterion of innovation brought by a collaborative couple
<b>3</b>	Addition of useful information to answer our research questions such as the age difference between the two members of the couple, the complementarity of skills between the two members of the couple, the fact of being co-founders of innovative reality or not and others

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At the end of Chapter 4 we offer some descriptive statistic of the database, useful to understand the following empirical analysis.

Chapter 5 is related to the description of three variables which, given their presence in the literature on shared/dual leadership and in the database, we found particularly interesting to analyze. The first two variables are extrapolated from the literature, while the third derives from our analysis of the database. The variables described in Chapter 5 are three. The first variable is Complementarity of Competencies: “Co-leaders need to have balancing expertise, experiences, skills, styles and networks in order to operate successfully” (Alvarez et al., 2007). Complementarity appeared to be one of the most important characteristics for pairs, and an important criterion to take into account while looking for a co-head. The competencies of the two members of the couples can be either Overlapping or Complementary.

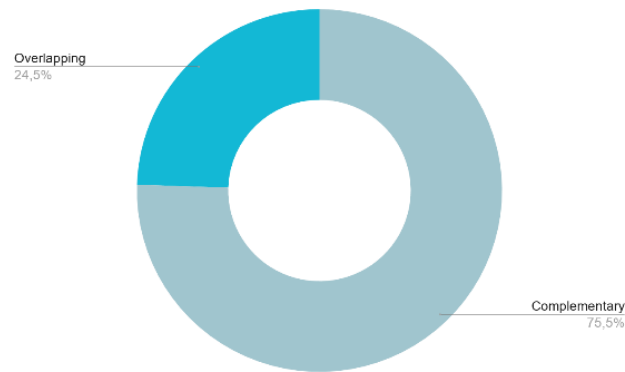


Figure 3: Distinction between Overlapping and Complementary couples

The second variable is Maturity of the Relationship: “A creation of trustful and loyal relationship was indispensable, as the confidence that emerged from trust and loyalty provided a space for mistakes to be made without jeopardizing the relationship” (Klinga, et al 2016). Maturity of the Relationship indicates the length of the relationship between the two members of the couple and their confidence level. Couples can have a High Maturity of the Relationship or a Low Maturity of the Relationship.

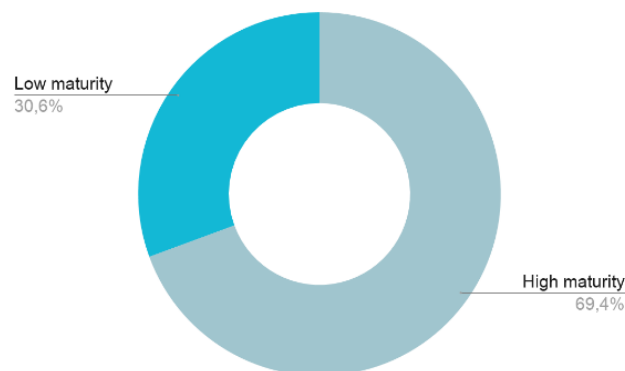


Figure 4: Distinction between Low Maturity of the Relationship and High Maturity of the Relationship couples

The third variable is Entity Type: this is a strictly empiric variable that derives from the database: it is the nature of the entity created from the collaboration between the two members of the couple. The three Entity types that we discussed are Companies, Startups, and Hybrids.

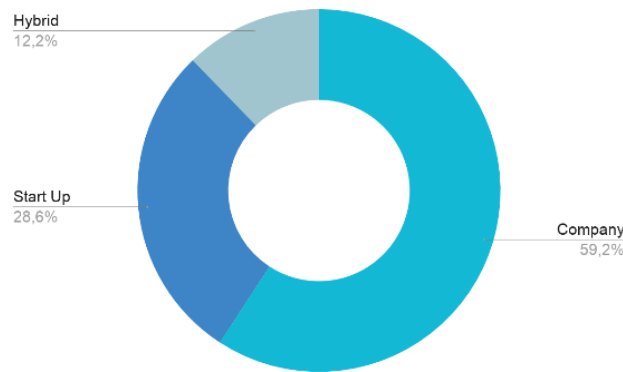


Figure 5: Classification between Hybrids, Startups and Companies of the couples in the database

Chapter 6, is related to the intersection of the variables together in order to better frame their impact on the couples and on the innovation they bring. The two intersections that we decided to perform are:

- Complementarity of Competencies with Maturity of the Relationship: in order to understand if these two variables influence each other and if they create an important cluster that deserves a deeper analysis,
- Maturity of the Relationship with Entity type: here we focused our attention on a more organizational/managerial aspect: we in fact focused on the relationship between the two members of the couple and on the different kinds of innovation that can occur given different kinds of relationships between the two innovators.

After the review one by one of all the couples of the database and the assignation of the characteristics of High/Low Maturity of the Relationship and Complementary/Overlapping skills (as it is possible to notice from the database itself, provided in Appendix), we summarized the results in the first graph, where the numbers written inside the graph represent the number of couples which belong to the specific quadrant.

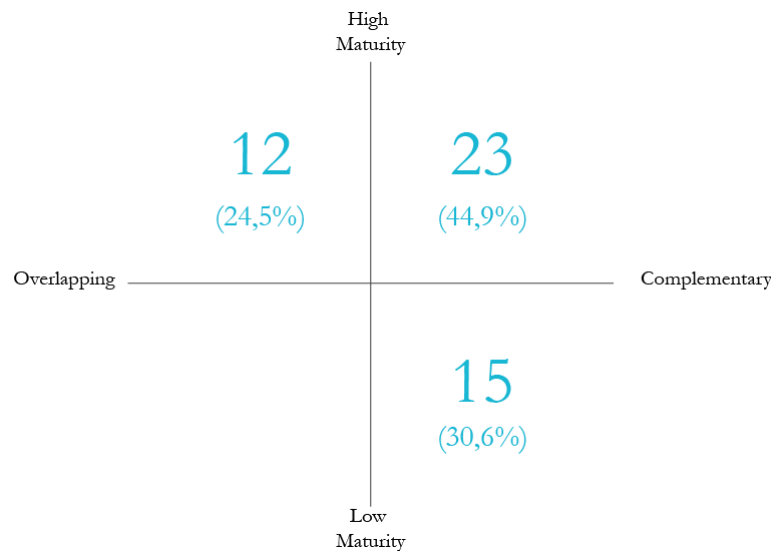


Figure 6: Cross 1. Maturity of the Relationship with Complementarity of Competencies

From the first cross, we noticed that the majority of the couples are characterized by a High Maturity of the Relationship and Complementary Competencies, while the quadrant related to Low Maturity of the Relationship and Overlapping Competencies is completely empty. This first intersection confirms what Kilnga et al., (2016) said about dual relationships: “A creation of trustful and loyal relationship is indispensable, as the confidence that emerges from trust and loyalty provides a space for mistakes to be made without jeopardizing the relationship”.

From the first cross of variables, we therefore affirm that trust, knowledge and confidence are essential when it comes to innovating and that individuals when they want to undertake a business project with someone tend to prefer someone known rather than someone who they do not know. This is also proved by the fact that the majority of the couples is concentrated in the High Maturity of the Relationship category, so we can safely argue that for a couple to develop an innovation takes its time. Time is mainly needed for developing trust and confidence between the two members of the couple. The last assertion that the cross leads us to tell is that the only way in order to make the members of couples

characterized by a Low Maturity of the Relationship innovate is that they have Complementary skills.

The second cross is the one related to the intersection of the variables Maturity of the Relationship with Entity type and it is represented as it follows:

High Maturity	26 (51%)	7 (14,3%)	2 (4,1%)
Low Maturity	4 (8,2%)	7 (14,3%)	4 (8,2%)
	Company	Startup	Hybrid

Figure 7: Cross 2. Maturity of the Relationship with Entity Type

Also in this case the numbers written inside the graph represent the number of couples that belong to the specific quadrant.

From the second cross we found out that for what concerns Companies, they are highly polarized in the High Maturity of the Relationship quadrant, Startups are perfectly divided between the High and Low Maturity of the Relationship quadrants, while Hybrids are concentrated in the Low Maturity of the Relationship quadrant.

The third finding we observed is that in our database individuals that have a superficial knowledge of each other mostly develop innovation using as a form of organization Startups and Hybrids, which are generally characterized by a

faster and riskier development. Conversely, when it comes to innovate inside the boundaries of a Company, innovation is mostly undertaken by couples characterized by a high level of trust and confidence.

We also performed a more in-depth evaluation of the categories by analyzing one category at a time, to figure out the specific characteristics that better explain the distribution of the 50 couples inside the chart.

Chapter 7 is the conclusion chapter: it illustrates the contributions, the limitations of the whole study and it provides suggestions about future possible researches, to further expand the state of art research about the dual and shared leadership and their link with innovation.



# 1 Introduction

## 1.1 Introduction to the chapter

This first chapter aims to give a wide overview of the state-of-art research about the topics of shared leadership and dual leadership, introducing also the main purposes of our thesis.

The chapter is structured as it follows:

- The first paragraph provides an overview of the concept of shared leadership, including the reasons why it is studied in the literature and in which contexts it is more easily applicable.
- The second paragraph provides a general overview of the concept of dual leadership, starting from the very origin of its study and including the reasons why it is studied in the literature and in which contexts it is applicable.
- The third paragraph is aimed to explain what can be considered as an innovation, what are the outcomes of innovation and how innovation is linked to dual leadership.

## 1.2 Shared Leadership

As stated by Professor Verganti from Politecnico di Milano in 2018: “In a world that keeps changing there is only one constant, that is change”: companies relate to an environment that changes very quickly, and employees must keep up with increasingly complex tasks in their everyday work. Moreover, very often the members of a team are not physically concentrated in the same geographical area, but they are dispersed, making the assertion of a single, hierarchical leader even more difficult (Konradt, 2014; Muethel, Gehrlein and Hoegl , 2012; Muethel and

Hoegl, 2010).

Trying to handle such uncertainty and difficulty, companies have already started organize their work in teams and projects (Scott-Young, Georgy and Grisinger, 2019; Cox, Pearce and Perry, 2003), thus questioning the validity of traditional hierarchical leadership models (Hoch, 2014) and distributing the leadership among the team members.

Existing researches indicate that shared leadership is particularly effective in such contexts that are knowledge-intensive, complex and dynamic (Ensley, Hmieleski and Pearce, 2006).

The literature does not agree on a single definition of shared leadership: Pearce and Sims (2001) define it as the “leadership that emanates from members of teams, and not simply from the appointed leader”; Carson et al. (2007) define it as “an emerging team property that results from the distribution of leadership influence across multiple team members”; but the most appropriate and complete definition used to define shared leadership is that of Pearce and Conger (2003), which define the concept as: “a dynamic, interactive influence process among individuals and groups for which the objective is to lead one another to the achievement of group or organizational goals or both. This influence process often involves peer, or lateral, influence and at other times involves upward or downward hierarchical influence”.

Despite the variety of definitions, it is easy to verify that what they all have in common is the fundamental distinction between a vertical leadership methodology, focused on the individual, and a more distributed methodology where decision-making power is distributed among the individual team members. In brief, the basic hypothesis of shared leadership is that the active participation of employees in leadership functions can improve the effectiveness and efficiency of the organization itself (Jeppesen, 2014).

As pointed by Zhu et al., (2018), the study of shared leadership started in the twenty-first century, so it can be safely argued that it is a relatively little

investigated topic, although, the concept of shared leadership can be rooted in earlier works (see Follet, 1924; Gibb, 1954; Katz & Kahn, 1978). From the mid-1990s onward, the perspective became more prominent in contemporary leadership theories and research.

Even if research on shared leadership is fairly recent, several studies have demonstrated the effectiveness of the application of the shared leadership methodology in teams in various contexts: starting from the application in the business environment (Sweeney A., Clarke N., Higgs M., 2019), passing through the scholastic field (Carpenter D., 2018), the field of healthcare (Espinoza P., Peduzzi M., Agreli HF, Sutherland MA, 2018) and the field of new ventures (Ensley MD, Pearson A., Pearce CL, 2003).

Virtually all studies showed a positive correlation between shared leadership and team performance, identifying also different antecedents and moderators of shared leadership (Serban and Roberts, 2016; Fausing et al., 2015; Müller, Pintor and Wegge, 2018).

However, beyond team performance, few other variables were considered as possible outcomes of shared leadership: some of them are pointed out by Zhu et al., (2018) which consider creativity (Liang and Gu, 2016, Hu et al., 2017), knowledge creation (Bligh et al., 2006) and innovation (Hoch, 2014).

### 1.3 Dual leadership

As the shared leadership model, also the dual leadership model is based on the assumption that leadership can be distributed between the members of the team: though in particular dual leadership appoints to those situations in which the leadership power is divided only between two members of the team. So, the second important leadership model that we analyze in our thesis is dual leadership.

The first reference that regards dual leadership can be found in Heenan and Bennis, (1999) which define it in terms of two leaders who are positioned equally

inside the team and who share the responsibilities of being a leader.

The body of literature concerning dual leadership is nowadays limited, however it emerges from past researches that dual leadership seems to be beneficial both at organizational and managerial level, including broader competence (Miles and Watkins, 2007), well-founded decisions, personal development and learning ( ), and an efficient use of team resources (Friedrich, Vessey, Schuelk, Ruark and Mumford, 2009). Moreover, as suggested by Hunter et al., (2017) the body of the literature, although being still limited, is constantly growing over time.

The state of the art literature regarding dual leadership privileged until now determinate fields, producing articles mainly related to: the scholastic context (Eckman, 2006; Eckman and Kelber, 2009), the business environment (Arena et. Al., 2011; Arnone and Stumpf, 2010), the healthcare sector (Klinga et. al., 2016) and the artistic field (de Voogt, 2006).

The results of research in these areas confirm that co-leadership promotes robust management by providing broader competence, continuous learning and joint responsibility shared by the couple of leaders (Klinga et al. 2016).

At the hands of the authors who analyzed it in fact dual leadership is a solution to organizational complexity from different perspectives: some authors pointed out that sharing leadership within two individuals can be useful in solving the paradox between exploration and exploitation (Hunter et al. 2017), while others (Klinga et. al., 2016; de Voogt, 2006) theorized that dual leadership can be useful in all those inter-sector situations where the situation requires the integration of different skills, which often cannot physically coexist in a single individual. As suggested by Hunter et al., (2017), however, we must be very careful in drawing a clear line between dual leadership models and traditional single leadership models, as there are many shades of grey between them and the distance between dyads and single - leading models is less than what might appear on the surface.

In his book “Powers of Two” (2014), Shenk focuses particularly on this last

aspect highlighted by Hunter: not believing in the theory of lone genius, Shenk begins to search for relationships even where common sense leads to believe in the presence of a single leader. He takes the example of Martin Luther King and Vincent Van Gogh: digging deep into the lives of these lone geniuses, he realizes that they had been not at all alone because they always had their personal supporter by their side. In the case of Martin Luther King the supporter was the Baptist minister Ralph David Abernathy, in the case of Vincent Van Gogh the supporter was his brother, Theo. So, to Shenk, the essence of innovation is rooted in creative couples. Once stated it, in his book he investigates the chemistry created between two individuals, looking for the profound reason why a particular person feels different in the presence of another person and searching for the common patterns that bind epics duos.

Realizing that relationships are in one way or another everywhere, Shenk identifies different types of relationships, which then categorizes into three fundamental clusters:

1. Overt partnership: it means collaboration. It is based on the fact that two people know each other, and work consciously and jointly on the same body of work.
2. Hidden partnership: it refers to the famous cases previously mentioned. There is one leader who is very well known, but who is not alone, because there is his other “half” behind the scenes that is always ready to influence him, to positively criticize him and to support him/her.
3. Distinct partnership: it is the case of the people who influence each other “from afar”, who probably do not know each other but who are able to cooperate actively influencing and supporting each other.

Shenk’s work is very useful for our research because it allows to better frame the phenomenon of pairs and in particular of creative innovative couples, which otherwise not find many space in the literature on shared leadership. Thanks to his work, in fact, we can understand that creative pairs are not an isolated

phenomenon and that couples represent indeed a model of leadership that can be useful to investigate, especially if the outcome to which the couples aspire is to create innovation.

It is exactly for this reason that we think that it could be interesting to dig deeper into the couples' matter and analyze how leadership works when it comes to pairs.

### 1.4 Dual leadership and innovation

Before further investigating the relationship between couples and innovation, it is necessary to give more information on what is considered innovation and what are its outcomes.

The Oslo Manual in measuring innovation defines four types of innovation: product innovation, process innovation, marketing innovation and organizational innovation.

- Product innovation: A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user-friendliness or other functional characteristics.
- Process innovation: A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.
- Marketing innovation: A new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.
- Organizational innovation: A new organizational method in business practices, workplace organization or external relations.

Given that, the activities that can be classified as innovative vary greatly in their nature. Some companies are engaged in precise innovative projects that involve

a significant investment in terms of time and resources, such as the development and launch of a new product, while others focus on small but continuous improvements both on products, but above all on processes and operations. For a complete understanding of the concept of innovation, we cannot avoid illustrating the concept of creativity, whose innovation is clearly linked: creativity is the ability to create with intellect, with imagination. The term is assumed to indicate a process of intellectual dynamics that has as characterizing factors particular sensitivity to problems, ability to produce ideas, originality in conceiving, capacity for synthesis and analysis, ability to define and structure in a way new experiences and knowledge.

Innovation comes exactly from creativity, and it is precisely the action of putting into practice the creative virtue in everyday life.

If we want to sum up the definition of innovation in one sentence we can say that innovation is every novelty, change, transformation that radically changes a previously established order, which has as its theoretical precedent an act of creativity carried out by an individual or a group of individuals. In this regard, Mumford, Scott, Gaddis, & Strange, (2002) state that leadership for innovation is different from any other kind of leadership. The principal disparities between the traditional leadership and leadership for innovation, as reported in Hunter et al., (2017) are three:

1. leading for innovation requires to create a structure where there is not already a clear direction, while non-innovative leadership is focused on preserving the structure that is already intact,
2. influence tactics such as power, pressure to conform, and commitment to the organization are less effective in leading for innovation because they may reduce exploration,
3. there is an innate conflict between producing and exploring, which is a central paradox of creative work.

For these reasons, leading for innovation is more challenging and more

demanding than leading in a non-innovative context, and it is precisely here that according to our assumption couples could enter the field to facilitate the handling of innovation.

Now that we have presented the two main leadership models that we are going to analyze in the thesis and the related field of innovation in pairs, we can state the objectives of the first part of the thesis itself.

Our first main objective is to create a theoretical framework about the state of art knowledge related to shared leadership and its possible outcomes, with special attention to one precise outcome, which is innovation. To this aim, the most authoritative reference text is certainly the article written in 2014 by Hoch: “Shared Leadership and Innovation: The Role of Vertical Leadership and Employee Integrity”. The article suggests that since shared leadership is an appropriate tool to cope with a complex and continuously changing environment, one of its possible outcomes is innovative behavior.

The second main objective of the first part of this thesis is to verify if, according to the literature dual leadership can be considered as a variant of the broader concept of shared leadership, that is to say if it is possible to describe the “couple” entity using as starting point the same theoretical framework that we are going to create for shared leadership. We do this in order to find out if the two leadership models can be analyzed using the same variables, to check what are the differences between them and most of all what are the characteristics that the two models have in common. To this aim, the most authoritative text is the article written in 2017 by Hunter et al.: “Why dual leaders will drive innovation: Resolving the exploration and exploitation dilemma with a conservation of resources solution”.



## 2 Literature Review

### 2.1 Introduction to the chapter

The aim of the first part of this chapter is to illustrate in detail the methodology to implement in order to gather the documents useful to examine shared leadership and dual leadership. The second part of the chapter is dedicated to the Systematic Review of the literature on the topics of shared and dual leadership.

The chapter is of fundamental importance for the scopes of the thesis, since from the base of the documents that we select and analyze here, we will delineate all the subsequent arguments which concern both the creation of the theoretical framework and the empirical analyzes conducted in the second part of the thesis.

The chapter is structured as it follows:

- Paragraph 2.2 is related to the methodology used in order to collect and analyze the documents related to shared leadership.
- Paragraph 2.3 introduces the aims and the structure of the Systematic Review of the literature.
- Paragraph 2.4 is related to the analysis of the Antecedents of shared leadership.
- Paragraph 2.5 is related to the analysis of the Moderators of shared leadership.
- Paragraph 2.6 is related to the analysis of the Outcomes of shared leadership.
- Paragraph 2.7 illustrates the theoretical framework related to shared leadership that we developed thanks to the analysis of the literature.

- Paragraph 2.8 is dedicated to the literature review of dual leadership.
- Paragraph 2.9 illustrates the theoretical framework related to dual leadership that we developed thanks to the analysis of the literature.
- Paragraph 2.10 is dedicated to the definition of the shared leadership Research Agenda
- Paragraph 2.11 is the conclusion paragraph where are defined the main objectives of the second empiric part of this thesis.

## 2.2 Methodology

The first part of this study is characterized by being a Systematic Review of the literature about shared leadership and its dual leadership variant, with an eye on their related outcomes, such as performance measurements and innovation. In order to select our bibliography base, we are going to use the Scopus database, which in our opinion it is an excellent mean to capture a broad overview of the topics related to shared and dual leadership, thanks to the enormous quantity of documents that it contains. The main purpose of creating a pool of selected articles is to have a strong bibliography base, which can be useful for the next steps of both the theoretical analysis (creation of the theoretical framework) and the empirical analysis (empiric study of the couples database).

In this thesis, the gather of the bibliography is conducted in four separate steps:

---

- |   |  |
|---|--|
| <b>1</b> Identification of the objectives of the research | Using as a starting point the existent literature, the objective of the first part of our research is to create a theoretical framework representing the linkage between shared leadership and its outcomes, plus to analyze whether if it is possible to describe the “couple” entity using as a starting point the same theoretical framework. |
|---|--|

2 Analysis of the research generated by the Scopus Database Search

Searching “Shared Leadership” keywords on Scopus: “Shared Leadership” (all abs, keywords, titles).

**Subject areas:** Social Sciences, Business Management

**Document type:** Articles, Book Chapters

**Years:** from 1950 to 2019

**464 documents found**

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3 Filtration of the publications and creation of a “shared leadership” literature base

Evaluation, selection or rejection of the found documents based on the complete reading of the related abstract. We mainly focused on finding articles related to a managerial context but we did not put a strong limitation on the scope of the article so as not to over-restrict the number of documents to use for the subsequent stages of our research.

**110 documents selected**

**17 documents added analyzing the references of the aforementioned 110**

**127 documents used as literature base**

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4 Creation and discussion of a first draft of the theoretical framework related to shared leadership and its outcomes

Creation of a theoretical framework that includes all the most important blocks concerning shared leadership and its outcomes.

Considerations about the possible expansion of the framework to the dual leadership variant

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### 1. Identification of the objectives of the research

As we pointed out before, what we propose to analyze with this paper is the relationship between shared leadership and its outcomes examined by different authors in the literature. In the majority of the cases, the authors found that the most important outcome related to shared leadership is improved team performance.

The second objective is to verify if some of the concepts related to shared leadership can also be transposed into a dual leadership framework, and mainly if it is possible to state that one of the preferred outcomes of dual leadership is innovation.

In particular, we want to verify which are the specific variables that in the literature's opinion affect shared and dual leadership: basically we want to understand if there is an underlying common structure between the shared leadership framework and the dual leadership framework.

The review of the literature found through Scopus, implemented in a systematic way, aims to probe the data obtained in order to identify the main authors, the most studied topics, the most accredited publications and the variables to take into consideration in the context of our research about the two leadership models.

### 2. Analysis of the overview generated by the Scopus Database Search

The second step after defining the research objective is the collection of documents on the Scopus database.

In order to obtain a base of articles investigating the themes of shared and dual leadership, we introduced in the search string of the abstract and citation database the words "shared leadership".

We decided not to insert also the word "innovation" in the search string because we noticed that doing so would have greatly reduced the number of results of the query, leading us to have too few documents for the purposes of this thesis. We

thus decided to maintain a broader overview of the theme in order to grab all the different shades of the subjects, not limiting the research to those documents that strictly refer to innovation.

Using the filters that the Scopus database offers, we also decided to limit the query to the subject areas of Social Sciences and Business and Management. We then chose to add a further limitation regarding the document type, limiting our analysis to articles and book chapters. We did not add a temporal limitation to our query, in order to evaluate and discuss the temporal distribution of the development of the literature about the topic from 1950 until 2019. The result Scopus gave to our query was a pool of 464 documents including articles and book chapters and containing the words “shared leadership” in the abstract, title or keyword index.

The exact search string we used for this operation is:

```
TITLE-ABS-KEY ( "shared leadership" ) AND ( LIMIT-TO ( SUBJAREA ,  
"SOCI" ) OR LIMIT-TO ( SUBJAREA , "BUSI" ) ) AND ( LIMIT-TO ( DOCTYPE ,  
"ar" ) OR LIMIT-TO ( DOCTYPE , "ch" ) ) .
```

In order to easily access the pool of articles that we used as a basis for our thesis all it takes is to copy this string in the advanced query bar of the Scopus database.

Regarding the 464 documents downloaded from the Scopus database, we now propose some overviews and descriptive statistics.

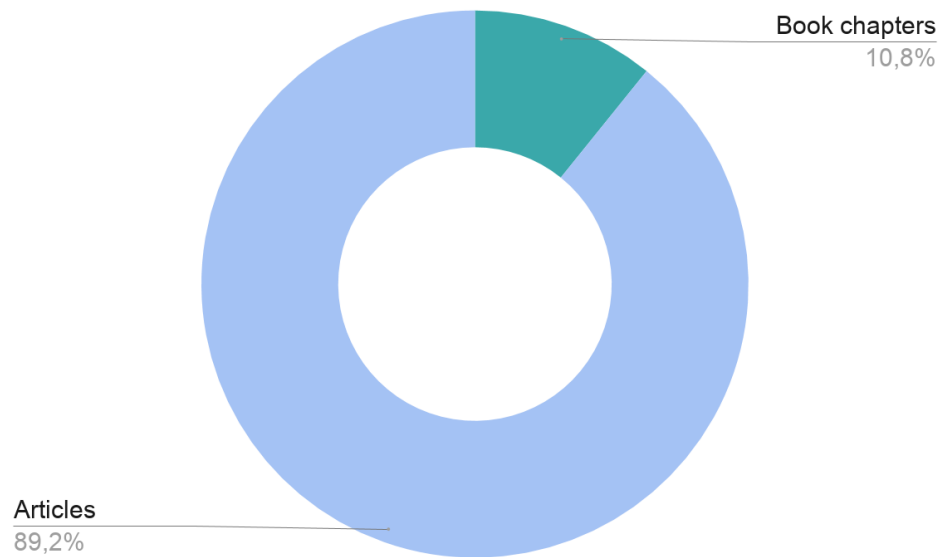


Figure 8: Percentage of Articles and Book Chapters in the 464 documents downloaded from Scopus

In order to propose a first discriminant on the sample of documents that we collected, the first general distinction that must be reported is that between book chapters and articles. It can be easily noted that the literature on shared leadership has developed over the years mostly through articles published in specialized journals rather than through books. In our sample, in fact, there are 414 articles, corresponding to 89.2% of the total, while there are only 50 book chapters, which represent the remaining 10.8%.

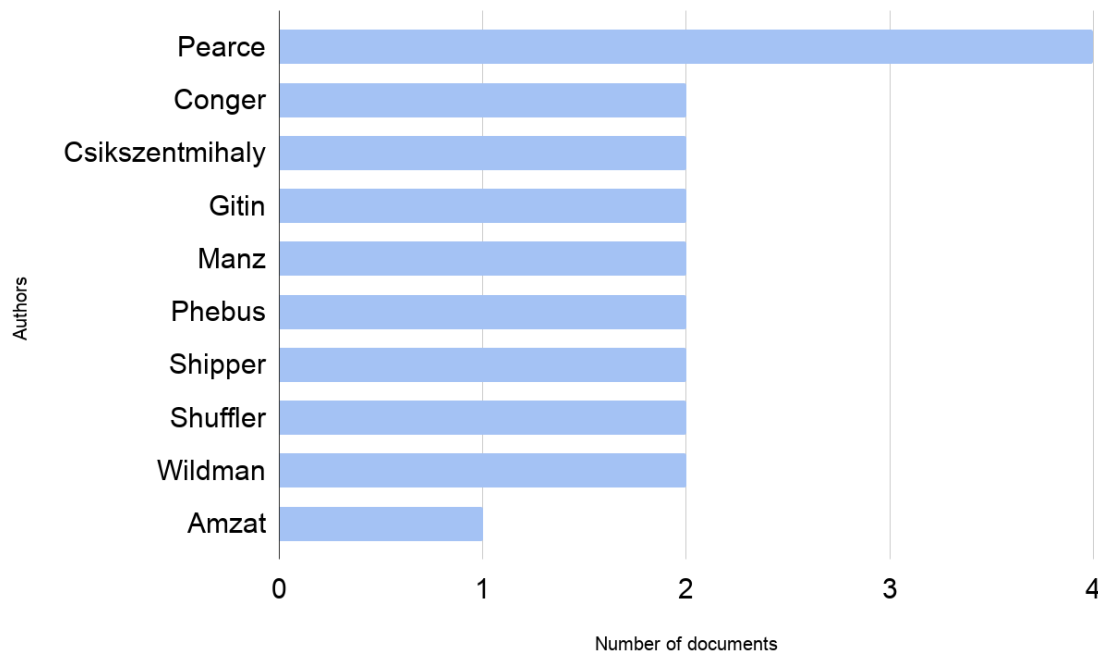


Figure 9: Book chapters' classification by author

A second-level analysis, specific on book chapters, shows how most of the book chapters present in the 50 documents considered were written by Pearce. Those book chapters are mainly part of one single book called “Shared Leadership: Reframing the Hows and Whys of Leadership” published by Pearce in 2003 that over the years has become a fundamental point of reference for the researches on shared leadership.

The chapters of this book are very often quoted in the literature that followed its publication: this fact can be easily verified through the analysis of citations available on the Scopus database. The chapter of Pearce's book that has received the highest number of citations is the first: "All those years ago: The historical underpinnings of shared leadership", written in collaboration with Conger, who received an overall number of 161 citations only on the Scopus database.

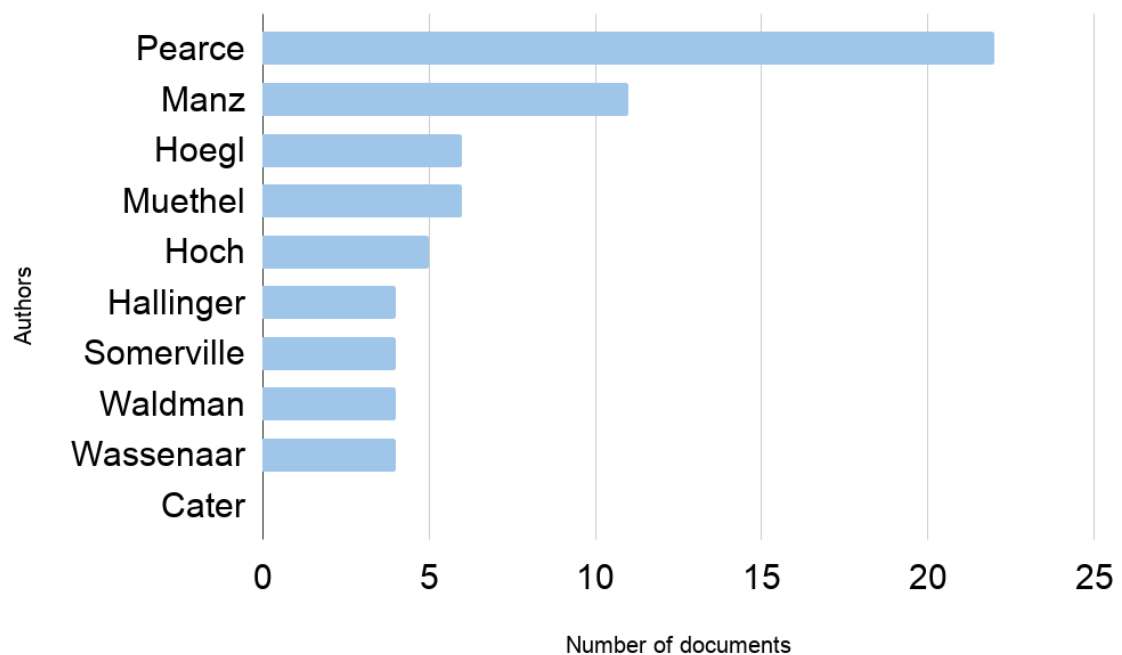


Figure 10: Articles' classification by author

Also from a second-level analysis regarding only the 414 selected articles, we can easily note that Pearce is the author who produced the highest number of documents. In the Scopus database, there are 22 articles written by Pearce. In second position there is Manz, with 11 articles, in third position Hoegl and Muethel with 6 articles and in fourth position Hoch, with 5 articles. We can therefore state that, according to the articles we found by entering the words shared leadership in the Scopus database, that in our opinion provide a relevant sample of the literature of shared leadership, the authors who have contributed the most to the development of the shared leadership literature are:

- Pearce
- Manz
- Conger
- Hoch



- Muethel.

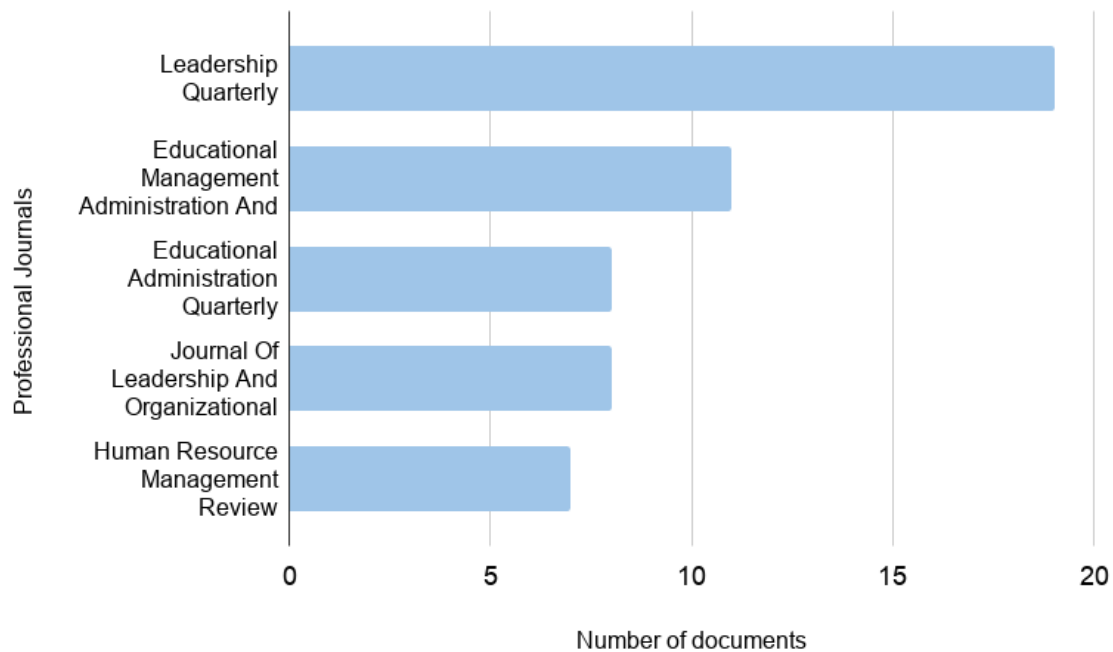


Figure 11: Articles' classification by professional journals

As for the sources of the articles, we find that journals specialized in leadership are obviously the main source of publication of the articles concerning the topics of shared leadership. It is particularly interesting to analyze the number of documents published since 1995, the year that marks the beginning of the multiplication of studies on shared leadership, as also shown in the chart concerning the number of documents published per year. Among the most active sources in publishing articles regarding shared leadership we find Leadership Quarterly, with 19 total publications featured in our sample, Educational Management Administration And Leadership, with 11 publications, Journal of Leadership And Organizational Studies with 8 publications and Human Resource Management Review with 7 publications.

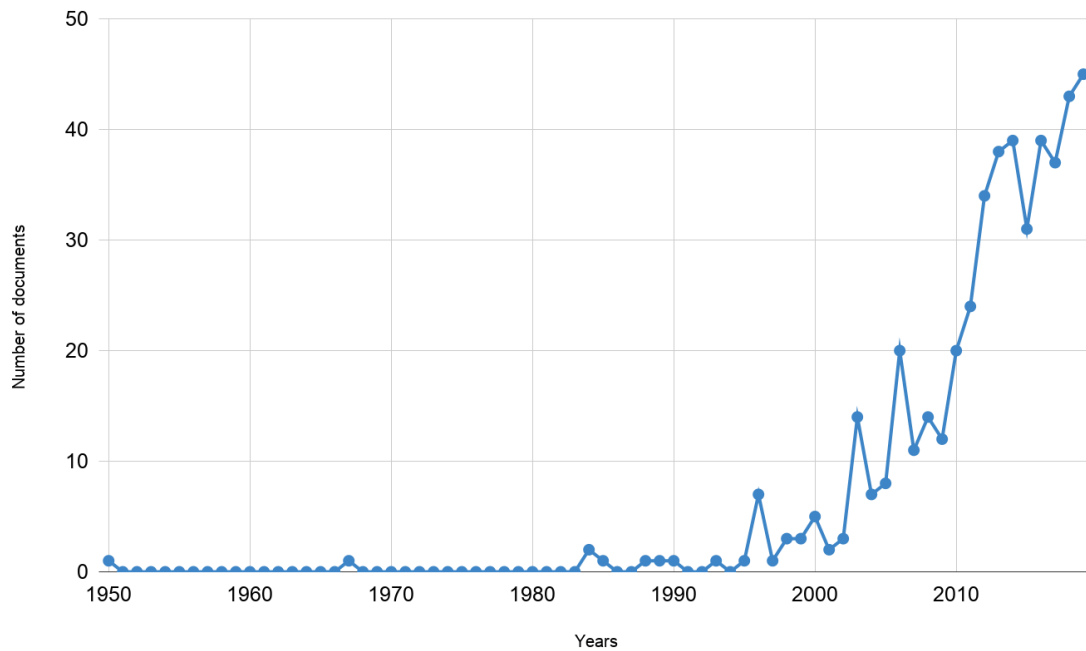


Figure 12: Distribution over time of the documents

Finally, to give an idea of how the shared leadership topic has developed over the years, we display the distribution of the 464 documents collected with the Scopus database from the year 1950 to the year 2019. We can easily notice that the topic started to arouse great interest especially starting from the 90s. In particular, between the end of the 90s and 2000 we see a surge in the number of articles regarding the shared leadership, a sign that the topic has been seriously considered by the scientific community. We can, therefore, state that shared leadership is a rather new area of research, which has certainly interesting managerial implications for organizations, but still presents some research gaps that will only be filled in the coming years with a more in-depth research on the subject. From the graph it can easily be noticed that the most prosperous year for the production of articles on shared leadership is up to now 2018 (43 articles published in 2018), but the positive trend is certainly destined to last over the next years, therefore we expect that in 2019 - 2020 the production of articles regarding shared leadership will increase.

3. Filtration of the publications and creation of a “shared leadership” literature base

After obtaining a general overview of the shared leadership context, all the 464 articles found in the previous step with the Scopus search are scanned and evaluated based on the complete reading of the related abstract.

In this step, the research aim is in fact to find articles that deal with shared leadership on one side and with dual leadership on the other side. In scanning the abstracts of the articles, we mainly focused in finding articles related to a managerial context but we did not put a strong limitation on the scope of the article so as not to over-restrict the number of documents to use for the subsequent stages of our research.

Realizing that the choice of the documents to be kept as a basis for the bibliography is a particularly delicate step, especially in a thesis that is characterized for being a Systematic Review research, we preferred to proceed with the reading of the abstracts individually and then to select only the documents that received positive feedback from both of the authors of this thesis.

The result of this operation led us to obtain 110 documents, including articles and book chapters: we created an Excel sheet containing all the positively evaluated documents and we proceeded with the full reading of all of them. While reading the 110 documents selected, we added further documents that we considered to be of particular interest to our research. The final database of documents fully-read is therefore composed of 110 documents found through the Scopus search, plus further 17 articles found mainly by analyzing the references of the aforementioned 110 documents.

Below we offer some analysis regarding the 127 documents selected for the integral reading.

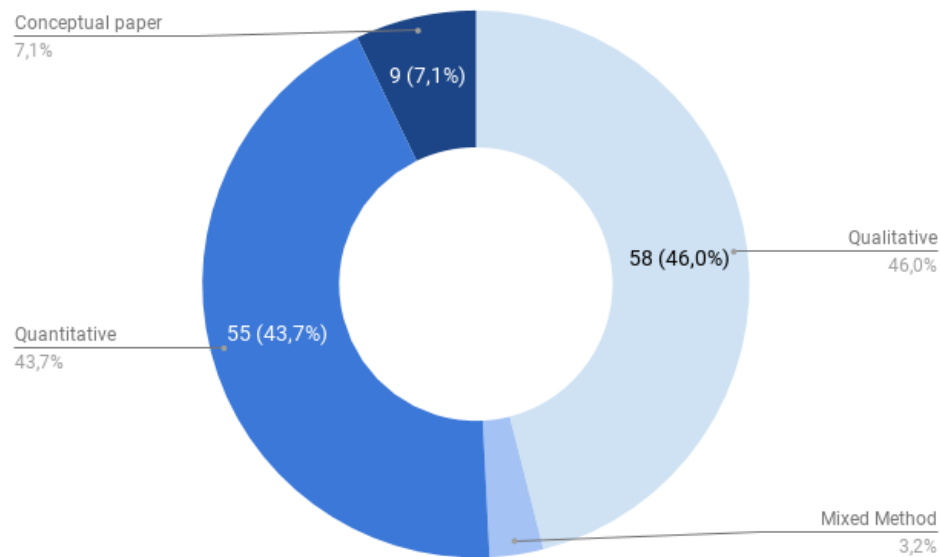


Figure 13: Classification of the selected documents by the general methodology of research used

We reported the general methodology of research of all the 127 documents selected, summarizing it in four clusters: qualitative papers, quantitative papers, conceptual papers (mainly systematic revisions of the literature) and mixed-method papers (thus composed by both a qualitative and a quantitative part). As it is possible to notice from the graph, the two main methodologies are almost equally distributed: in fact we selected a 44,1% of quantitative documents and a 45,7% of qualitative documents (corresponding to 56 plus 58 documents), leaving space for a 3,1% mixed-method documents (4 total documents) and a 7,1% of conceptual papers which stands for a total 9 documents.

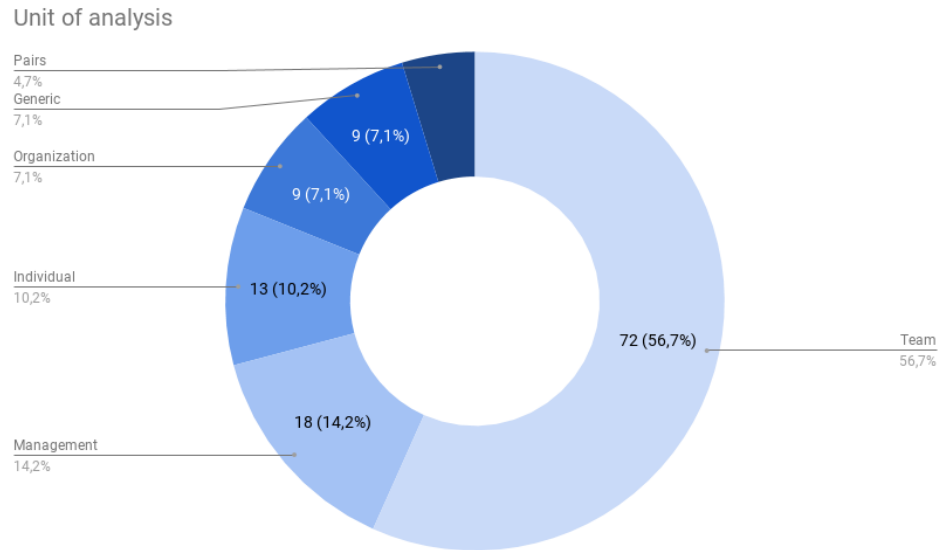


Figure 14: Classification of the selected documents by unit of analysis

A further analysis made on the selected documents regards the unit of analysis. We consider the subject on which the research activity of each document is focused and we report it using six different categories.

The first category is represented by the team: more than half of the selected documents take the team as a fundamental unit of analysis. This result is totally in line with what we expected from a bibliography with a focus on shared leadership: shared leadership is in fact a typology of leadership that is implemented in teams, it is therefore natural that the majority of the documents considers the team as the most important unit of analysis.

The second category is represented by management: 14,2% of the documents takes as the fundamental unit of analysis management, intended as the top management of a firm that usually is analyzed in the paper.

The third category is represented by individuals, intended as persons: the articles here refer to a general individual who is not a manager.

The fourth category takes as a unit of analysis the organization intended as an entity in which individuals go to work.

The fifth category is represented by a generic unit of analysis: here there is not a

particular unit of analysis because the articles to which refer this category are the 9 conceptual papers that we pointed out in the previous paragraph. In a conceptual paper the main subject is the review of the literature on a specific topic, thus there is no need to set a specific unit of analysis for this kind of papers. The sixth category is represented by pairs: 6 documents over 127 take as a fundamental unit of analysis the pair, intended as a pair of leaders at the top of the organization.

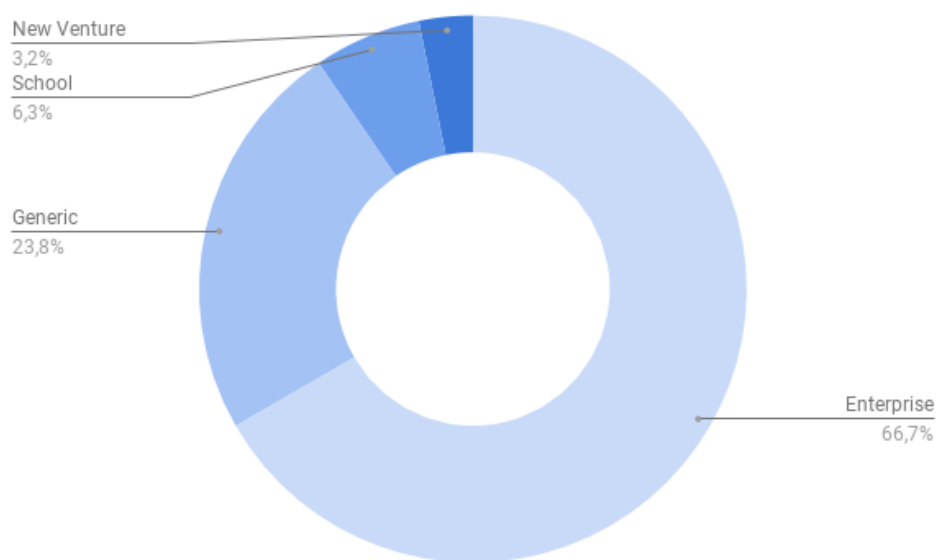


Figure 15: Classification of the selected documents by subject area

A final analysis of the selected documents concerns the subject areas of the document. We have analyzed the contexts of application of the 127 documents and reported them in a pie chart. As it is possible to note from the graph, the area that has been mostly investigated by the literature on shared leadership is the enterprise area, followed by the generic context, which means general theories about shared leadership not related to a specific context of application.

4. Creation and discussion of a first draft of the theoretical framework related to shared leadership and its outcomes

Our literature review work can be defined complete with the creation of a first initial draft of a theoretical framework that includes all the most important blocks concerning shared leadership and its outcomes. The creation of the scheme was facilitated by the reading of the literature, which in general, when it comes to shared leadership, always refers to the same fundamental categories that we are going to explain in the next chapter.

The purpose of this scheme is to enclose the fundamental elements of shared leadership, investigating how it is born, why it is born, why it is useful to study shared leadership in an innovation context and which are the variables that influence the relationship between shared leadership and its outcomes. Together with the creation of the first draft of the shared leadership theoretical framework, we also start to think if the newly created schema could also be used to describe the "couple" entity.

## 2.3 Systematic Review of the Literature

The aim of this paragraph is to present the review of the different documents that we downloaded from the Scopus database. At the end of the paragraph we will present the final definitive theoretical framework that we are going to build starting from the analysis of the past literature concerning shared leadership. In fact, once we drafted the general conceptual scheme related to shared leadership and its outcomes, we started to dig deeper into the matter and refine the scheme using as a reference the already existing literature that we downloaded from the Scopus database.

In reading the papers, we realize that often articles are composed simply by an explanation of a theoretical framework exposed to the opening of the article itself. Those theoretical frameworks are usually depicted at the beginning of the article and are organized in a block structure: those blocks are connected to each

other by arrows, which indicate a positive relationship between the blocks (Hoch, 2012; Hoch, 2014; Wu et al. 2018; Fausing et al., 2015 to mention a few).

From this fact, we therefore understand that the previous literature, in analyzing shared leadership, follows a specific *modus operandi* that we would like to maintain also in our thesis.

Generally the theoretical frameworks found in the literature are composed of three fundamental blocks:

- Antecedents,
- Moderators,
- Outcomes.

Antecedents refer to all those phenomena that temporally precede shared leadership and that favor its introduction at a team level, while moderators impact on the effect that shared leadership has on the outcomes: this means that they boost or diminish the effect of the shared leadership on the outcomes. Finally the outcomes can be varied: generally the most studied outcome is the effect of shared leadership on team performance (Han et al., 2018; D'Innocenzo et al., 2016; Barnett & Weidenfeller, 2016; Zhang et al., 2012), but also other variables have been taken into consideration, such as client satisfaction (Carson et al., 2007), business performance (D'Innocenzo et al., 2016), business innovation (Hoch, 2013), organizational effectiveness (Pearce and Sims, 2002).

Hence the idea of building a scheme that could include all the fundamental blocks of shared leadership encountered reading the literature. Our pursue is to create a theoretical framework about the state of art knowledge related to shared leadership and its possible outcomes, with special attention to one precise outcome, which is innovation. We will then try to explain the “couple” entity through the same scheme, verifying whether the two leadership models analyzed so far (shared leadership and dual leadership) show points of contact and common variables.



## 2.4 Antecedents

Much has been investigated until today on shared leadership and its potential beneficial effects especially on team performance and organizational outcomes, but the antecedents of shared leadership have received way less attention. Moreover, to the authors' knowledge, there is still no study that actually demonstrates how the antecedents lead to the creation of shared leadership: this research gap has forced us to limit our study to a summarizing overview of the antecedents, to a subdivision of antecedents into macro-categories and to the choice of those that in our opinion could be more significant for explaining the effects of shared leadership on innovation.

A deep research on the antecedents of shared leadership, however, could be very useful to understand what are the conditions that must be implemented to reach high levels of shared leadership, since, as highlighted by several authors, it influences performance and team effectiveness in a positive way (Zhou et al., 2017; Barnett & Weidenfeller, 2016; Hoch et al., 2010).

As lamented by Reiter (2015) and Zhu et al. (2018), the majority of studies focuses on the side of shared leadership outcomes, especially on the impact on performance, while relatively few studies focus on the factors that lead to the emergence of shared leadership in teams, even if they are of fundamental importance in the implementation of this particular leadership style.

Starting from these considerations we therefore will analyze our selected papers looking for antecedents of shared leadership. In order to divide the antecedents, we will use five macro-categories which indicate five different levels of antecedents. These five levels capture and summarize, in our opinion, all the most relevant aspects regarding antecedents and their potential influence in the emergence of shared leadership.

The categories that we are going to use for clustering the antecedents are:

- Country level antecedents
- Team level antecedents

- Leader level antecedents
- Environment level antecedents
- Task level antecedents.

Part of this categorization is already present in the literature.

### 2.4.1 Country level antecedents

There is only one article that refers to antecedents at Country level: the article written by Muethel and Hoegl in 2010 considers all those Nation-level factors that facilitate the emergence of shared leadership in organizations. The article in question is called "Cultural and societal influences on shared leadership in globally dispersed teams". It opens with the consideration of four different reasons for which shared leadership can be an effective solution in the management of dispersed teams, then it defines the so-called Country level antecedents, that are divided in turn into three categories: Regulative antecedents, Normative antecedents and Cognitive antecedents.

The Regulative dimension advocates the creation and maintenance of a regulatory system that includes **economic freedom, civil liberties and political liberties**, since the three of these factors positively affect the emergence of shared leadership in organizations. The Normative dimension includes six different antecedents, positively linking the emergence of shared leadership to **performance, orientation, uncertainty, avoidance, assertiveness, institutional collectivism and human orientation**.

The Normative dimension also finds a negative correspondence with the emergence of shared leadership with is related to **power distance**. Power distance represents the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. It is measured with the Power Distance Index: the lower the index, the less the low-powerful members of the organization accept the unequal distribution of power.

Finally, the Cognitive dimension, which encompasses demonstrations of initiative or the engagement in mutually influencing processes (Muethel and Hoegl, 2010), positively connects **learning orientation** with the emergence of shared leadership.

#### 2.4.2 Team level antecedents

Most of the articles that explicitly deal with the antecedents of shared leadership focus on this particular category that we created from scratch due to its importance. The antecedents at the team level are taken into account by different authors, and for this reason their number is quite substantial. Some antecedents, however, being very far-reaching, include other more specific antecedents, moreover, some antecedents are called in different forms by the different authors who report them, even if basically the content they want to convey is the same. This is, for example, the case of the antecedent called “task cohesion” by Serban & Roberts (2016), and called “team maturity” by Wu et al. (2018).

Since for the purposes of our thesis it is not necessary to analyze one by one all the antecedents found in the analysis of the literature on shared leadership, we will deepen only those deemed most important for the shared leadership to emerge.

Arguing about antecedents at team level, certainly the most authoritative and quoted text among those found is the article by Carson et al. (2007). According to their study “Shared leadership in teams: An investigation of antecedent conditions and performance” for shared leadership to emerge, there are two necessary conditions:

- Team members must offer their leadership and at the same time try to influence the direction and motivation of the groups,
- The team as a whole must accept leadership from more than one group member: there must therefore be a willingness to accept.

Moreover, according to this study, there are two factors that are actually antecedents of shared leadership:

1. **Internal team environment that supports the development of shared leadership over time,**
2. **External team coaching.**

Speaking about the internal team environment, the authors refer that an overall team environment that consists of three dimensions facilitates shared leadership: those dimensions are shared purpose, social support, and voice. These three elements work together and influence each other to produce a context that promotes and the willingness of the members to offer their leadership and to trust the leadership of others. Shared purpose “exists when team members have a similar understanding of their team’s primary objectives and take steps to ensure focus on collective goals” (Carson et al. 2007). That means that if you agree with your team on a specific goal, you likely feel more motivated and willing to work towards that specific goal. Social support is defined as “team members’ efforts to provide emotional and psychological strength to one another” (Carson et al. 2007). When team members recognize the contribution of others, the individual feels valued and more willing to cooperate with others, therefore a sort of shared responsibility for the group’s performance grows. There is no standard definition for voice, however, it can be considered as how much “voice in the matter” each individual has on the way the work is developed. If there is a high level of voice presumably there is a high level of social influence between the team members and therefore an environment in which shared leadership can be effectively developed.

For what concerns external team coaching, it stands for the analysis of the role of the external team leader, which is absolutely critical. The leader, in fact, must know how to increase the motivation of the team members and increase their ability to self-guide and self-direct themselves in projects. There are different types of team coaching: there are forms that are more “supportive” and that aim

to reinforce self-leadership in a team and forms that aim to identify team problems and solve them, thus interfering with the self-leadership dynamics of the team itself. Moreover, “coaching provided by an external team leader is particularly important for the development of shared leadership when teams lack a strong internal team environment” (Carson et al. 2007). We are going to further deepen the theme of external team coaching in the “Leader level antecedents” section.

Equally interesting to our research, but surely less quoted in the literature, is the already mentioned article by Hoch (2013) “Shared leadership and innovation. The role of vertical leadership and employees’ integrity”, where other two fundamental antecedents of shared leadership are described. The article begins arguing that little has investigated on the effects of shared leadership, and mainly on the impact that shared leadership has on teams’ performance. Hoch’s proposal is therefore to investigate the effect of shared leadership on innovative behavior.

In order to link shared leadership with innovative behavior, Hoch puts innovation as an important factor that influences the ability of organizations to adapt to change and to remain competitive despite changes in the environment, expecting shared leadership to facilitate the ability of organizations to adapt to this change.

The antecedents that Hoch takes into consideration as factors that predict the introduction of shared leadership are two: **a vertical and empowering leadership** and **team member integrity**. The concept of vertical empowering leadership in terms of empowering and individual empowering teams, also developed by Fausing et al. (2015), supports the need for a so-called "Super Leader" for the emergence of shared leadership in organizations. The Super Leader is an “illuminated” leader who, instead of controlling and directing others, transfers power and responsibility to the members of the group, strengthening them and making them autonomous. Both Hoch and Fausing also show that

external coaching behaviors are more significant, for the emergence of shared leadership in teams, where a strong and supportive internal environment is scarce rather than in those where the internal environment is strong. The concept of team member integrity goes back to the literary trend of team member personality, investigated among others by Pearce and Sims, (2000); Scott-Young et al., (2019): the basic assumption of personality lies in the fact that the level of shared leadership that a person is willing to accept is different based on his/her personality. In Hoch's opinion, according to their personality disposition, members high in integrity are more likely to share the lead. Hoch says that social responsibility, or integrity, is related to shared leadership for many reasons. She says that "first, socially responsibility means being reliable. Reliability is important for being predictable in the long run. Team processes need to be considered in a longitudinal sense. In the long run, teams need to be reliable and make sure that those who contribute and share information will be rewarded in return. Shared leadership will thus benefit from higher levels of integrity because it includes higher levels of reliability among the team members. If team members are more reliable, they are more likely to reciprocate and less likely to abuse each other and this will help shared leadership to develop". (...) "Second, being high in integrity means being trustworthy. Developing shared leadership requires that information be exchanged freely and transparently, which also allows improving each other's ideas. Generally, the sharing of team members' unique and disjunctive (non-overlapping) knowledge (e.g., Carson et al. 2007) will be more likely in teams where members are higher in trustworthiness. Conversely, sharing of information is unlikely without trusting in other team members' integrity. Thereby, team members that are higher in integrity themselves are also more likely to trust others. Trustworthiness, as an aspect of integrity, will therefore be related to shared leadership." Robert & You, (2018), who directly link trust and shared leadership in virtual teams, also taken up the concept of trust. In their opinion, virtual teams that are based on shared leadership are those whose

members have proven to be worthy of trust “by fulfilling their leadership roles and responsibilities or assisting others in fulfilling their roles” (Robert & You, 2018), while teams that do not rely on shared leadership when the team members are not fulfilling their leadership roles and responsibilities. Also Rolfen, (2010) dealt with the role of trust, this time in the context of cross-functional teams: trust between the workers and the supervisor is in fact identified as one of the eight fundamental variables to create a highly functional cross-functional team. Phebus et al., (2010) conceived trust and team cognition as the two variables supporting the leaders of global virtual teams, while Bligh et al., (2006), quoting Cummings and Bromiley, (1996), defined trust as “an individual’s or group’s belief that another individual or group will make efforts to uphold commitments, will be honest, and will not take advantage given the opportunity”. They then distinguished two types of trust: affective-based trust and cognitive-based trust. Affective-based trust is based on high levels of citizenship behaviors and frequent social interactions, and leads to the open exchange of information and increased tendency to reveal sensitive personal information, knowledge, and ideas. In contrast, cognitive-based trust develops when an organizational member perceives that another actor has demonstrated reliable role performance in the past and possesses satisfactory professional credentials (McAllister, 1995).

Also Hunter et al., (2017) wrote about trust: they said that it is not enough to share the leadership of the team in order to achieve better performance. There has to be a “basic level of respect and trust” between the leaders, otherwise “there is the potential for a toxic relationship to occur”.

One last antecedent at the team level that we consider particularly interesting for the purposes of our research is **complementarity**. This antecedent can be located in our opinion both at the team level but also at the task level, in fact we are referring to the complementarity of both the personalities of the team members, but also to the complementarity of the tasks to be performed within a

project by each member of a team. Fausing et al., 2015, refer to complementarity arguing about “Interdependence in terms of Goals and Tasks”: interdependence reflects the mutual dependence that team members have between them in carrying out their work. For the very definition of shared leadership, ie cooperation, interaction and mutual influence between group members, interdependence is a necessary condition because shared leadership emerges and persists within a team. Kukenberger & D’Innocenzo, 2019, argue that shared leadership “likely occurs when members have different, valued, and complementary motives to distribute leadership across the team”, they call this “diversity” factor, but it may be interpreted as complementarity. Two types of diversity are then identified: social categorization and informational/functional. The first focuses on observable attributes (ex: sex, age or ethnicity) while the second is more related to work and less observable (ex. functional task-related expertise). Functional diversity means complementarity of tasks: shared leadership is therefore more likely to occur when team members have different but complementary skills.

### 2.4.3 Leader level antecedents

The authors who dealt most extensively with the antecedents of shared leadership at the level of leaders are Scott-Young, Georgy and Grisinger (2019). They analyzed shared leadership in a project management context and developed a Systematic Review allowing “a holistic understanding of how shared leadership develops and how it can impact individual, team, project and wider organizational performance”.

In their research the antecedents are called “inputs” and are divided into three basic categories: Macro, Meso, Micro.

The attributes and behaviors of the formal project manager (which in our research is identified as the leader) that are positively correlated to the shared leadership are:



- **Encourages SL** (Hoch and Dulebohn, 2013)
- **Humility** (Chiu et al., 2016)
- **Empowering** (Hoch, 2013; Fausing et al., 2015; Grille et al., 2015)
- **Facilitates expertise sharing** (Muethel and Hoegl, 2016)
- **Fosters collaborative decision making** (Muethel and Hoegl, 2016)
- **Respects competencies** (Muethel and Hoegl, 2016)
- **Provides coaching support** (Carson et al., 2007)
- **Rewards SL** (Grille et al., 2015).

The role of the project manager, being the leader of the group, must be to encourage other team members to take responsibility: this, in turn, leads to the division of leadership between the group.

A leader who rewards shared leadership behavior (Grille et al., 2015) and who provides the aforementioned coaching support (Carson et al. 2007) actually stimulates the emergence of shared leadership in her/his team.

It can therefore be noted that the initial role of the leader, that of encouraging the members of the group to acquire responsibility, is fundamental for the transition from a vertical leadership style to a horizontal style. Besides, to encourage individuals to take on responsibilities, the leader also has to create a positive and supportive climate in which people can feel free to take the initiative in respect of the goals of the project and the other team members.

#### 2.4.4 Environment level antecedents

Regarding the antecedents at the environment level, the most authoritative and quoted text is certainly an article by Pearce and Sims, (2000). In their article “Shared leadership: toward a multilevel theory of leadership”, the two authors proposed a series of antecedents to shared leadership in the form, among others, of environmental characteristics.

The environmental characteristics are defined as the characteristics that are external to the group and that do not depend on it, but that affect the group's

functioning: the three environmental characteristics that, according to the authors, have the greatest impact on the development of shared leadership are:

- **Support systems,**
- **Reward systems,**
- **Cultural systems.**

Support systems include education and skills development, information systems and the like: “shared leadership is more likely to be reinforced and received by others when the leadership is backed up by a viable support system”.

Reward systems can be distinguished in two categories: those which encourage individual behavior and those which encourage collaborative behavior. Of course for the emergence of a shared leadership style, it is strongly suggested to firms to adopt a reward system that encourages collaborative behavior.

Cultural systems exist at many levels (national, regional, organizational...) and they can have a powerful impact on individuals. “For example, if a cultural attribute is that of ‘do not question authority’, the ramifications for shared leadership seem likely to be different than in a culture where ‘questioning authority’ is highly valued”. Also, the cultural system is therefore an important variable to take into account speaking about the conditions that favor the emergence of shared leadership in an organizational context.

### 2.4.5 Task level antecedents

Finally, we analyze the antecedents at the task level. Also for this type of antecedents the main source is the article by Pearce and Sims (2002) which analyzed the most relevant characteristics that the tasks have to respect in order to facilitate the emergence of shared leadership in a group’s context. Those identified characteristics are five and are the following:

- **Interconnectivity:** When individuals’ tasks within the group are interconnected, one would expect more opportunities for the development of

shared leadership. Alternatively, if individuals' tasks in a group are entirely independent, the opportunity for shared leadership is likely diminished.

- **Creativity:** Creative group tasks, by their very nature, generally require inputs from multiple individuals. If a task calls for extreme amounts of creativity it seems more likely that one would observe the display of shared leadership.

- **Complexity:** As task complexity increases, the opportunities for shared leadership seem also likely to increase.

- **Criticality:** If the task has no practical significance and is non-critical it seems likely that the level of shared leadership would likely be low and its character passive. On the other hand, if a task is highly critical, the display and form of shared leadership are most likely different.

- **Urgency:** When the timing of task completion is unimportant the impetus for SL. However, when the timing is of the essence the display of shared leadership seems more likely

## 2.5 Moderators

Moderators are those factors that limit or moderate the impact of shared leadership on the outcome(s). They are useful for understanding the limits of the effectiveness of shared leadership and they are positioned in our conceptual model between shared leadership and the outcome taken into consideration, which is innovation.

As we have already mentioned in the previous paragraphs, the major part of the studies concerning the relationship between shared leadership and team performance suggests that shared leadership is an important predictor of a positive team performance, but there are some cases, for example, Fausing, (2015), which state that shared leadership does not always benefit the performance in every kind of context. Fausing, (2015), investigates the moderating effects that teamwork function and team autonomy have on the performance outcome.

As Fausing, many other authors investigated the factors that moderate the impact of shared leadership, mainly considering team performance as its principal outcome. So, since in the literature about shared leadership there are many references about the moderators, we will make a classification dividing them into two categories:

- team level moderators
- task level moderators.

### 2.5.1 Team level moderators

Most of the moderators identified by the literature are those at a team level. At the team level, team tenure (Nicolaidis et al. 2014), team autonomy (Fausing et al., 2013), age difference (Hoch et al., 2010), coordination (Hoch et al., 2010) and intragroup team trust (Wu et al., 2018) were examined by different authors as possible moderators for the impact of shared leadership on the outcomes.

Nicolaidis et al. (2014), in their meta-analysis on the shared leadership in teams, examined shared leadership as an input with effects on team performance: they found out that there are several situations in which shared leadership is more clearly related to team performances. At a team level, they gave big importance to **team tenure**: they found out that as team tenure increases, shared leadership validities decreases. In their opinion this can happen for two reasons: the first reason is that the members of the team cannot stand shared leadership for a long period of time because it can lead to potential power struggles, while the second reason is that longer-tenured teams can become very rigid and committed to already established procedures and routines that are in contrast with the concept of shared leadership.

Fausing et al., 2013 and Rolfsen et. al., 2013, on the basis of the previous literature (Stewart, 2006; Stewart & Manz, 1995) found a positive relationship between **team autonomy** and team performance, thus identifying team autonomy as an important condition for a successful adoption of shared leadership processes in

teams. They argued that “the success of shared leadership processes depends on a certain degree of experienced influence and autonomy in the team such that the team members have the freedom to lead each other and to solve their tasks and plan their activities autonomously within the team” (Fausing et al., 2013). They thus stated that team autonomy is a moderator of shared leadership and that the relationship between the two is more positive when there is high team autonomy. Hoch, Pierce and Welzel, (2010) examined the moderating effects of **low age difference** and **coordination** on the relationship between shared leadership and team performance in teams.

In the wake of what has been said also by Cox et al., 2003, they argued that in teams that are homogeneous from an age point of view it is easier to establish a stronger bond and that team members treat each other more similarly, rather than teams with members of different ages. Age difference obtains in the literature conflicting opinions: on the one hand there are theories that state that a great age difference can negatively influence the team's performance (Jackson et al., 2003), on the other hand, there are theories that instead invoke age difference for its beneficial effects on performance (Kerschreiter et al., 2003). The hypothesis verified in the article by Hoch et al. states that “age diversity will moderate the relationship between shared leadership and team performance in such a way that: a) shared leadership in teams will display a positive relationship to team performance when age diversity is low, whereas, b) shared leadership will display a negative effect to team performance if age diversity is high”.

Also team coordination is an important moderator that Hoch et al. took into consideration. Team coordination is aimed at “coordinating the individual team members’ prior work expertise, implicitly, via situated interaction patterns and practices in order to make the individual team members’ expertise accessible to the team” (Hoch et al. 2010). The presence of coordination is in contrast with shared leadership, in fact if both shared leadership and high coordination are

present, team members may feel overwhelmed, not understanding where to pay more attention, and therefore lowering team performance.

Thus, Hoch et al. argued that shared leadership and coordination are linked, but in a negative way, so that shared leadership has a positive effect on the outcome only if the level of coordination in the team is low.

**Intragroup team trust** has been analyzed as a moderator in the relationship between shared leadership and its outcomes: Wu et al., (2018) posited that trust is a “critical mechanism in the shared leadership - outcomes relationship”. In fact, in sharing the leadership role within the members of the team, members accept and influence their behaviors in order to reach a common objective. In doing so cooperation and trust are built, and the effects on the outcomes are positive.

We have therefore examined five possible moderators of the effects of shared leadership on outcomes: all the examined moderator have a positive impact on the relationship (it means that in presence of that specific moderator the link between shared leadership and the outcome is more strong), except for coordination which has a negative association with the outcomes of shared leadership.

### 2.5.2 Task level moderators

There are two important moderators that regard the tasks that the team members have to handle: task complexity (or perceived task complexity) and task interdependence.

The task level moderator which was most taken into consideration by the literature is **task complexity**. However the literature regarding task complexity leads to conflicting conclusions: in fact Wang et al. (2014) and Fausing et al. (2013) found that shared leadership has more effect on outcome when the team's work is more complex, while D'Innocenzo et al., (2014) found exactly the opposite, namely that the impact of shared leadership on the outcomes is less intense as team members perceive the task difficult. Moreover, Muller et al.,

(2018) in their article examined the effect of shared leadership on the quality and quantity of team performance. They found out that shared leadership increases the performance of the team by influencing the quantity (level of performance) and the quality of the same (mistakes made).

The final results of this article are mainly two:

1) Shared leadership is positively related to team performance quantity and team performance quality.

2) The relationship between shared leadership and team performance (quantity and quality) is moderated by perceived task complexity, such as shared leadership is more strongly related to team performance when teams perceive high task complexity. This means that the positive effect of shared leadership on performance is perceived especially in teams that feel they are handling complicated tasks. This is why, in the authors' opinion, shared leadership can be particularly important in situations that involve complex tasks and where there is high risk and where it is therefore absolutely necessary to avoid errors.

The second most-analyzed task level moderator is **task interdependence**. Task interdependence is defined by Bishop and Scott (2000) as the degree to which team members depend on their interactions and support from others in order to perform tasks. The already mentioned articles by Nicolaides et al., (2014), D'Innocenzo et al., (2014) and Wu et al., (2018) in their meta-analysis of shared leadership refer to task interdependence as a moderator of the effects of shared leadership on its outcomes, finding conflicting results. However, the studies that found that task interdependence is a positive impacting moderator on the outcomes of shared leadership are more relevant in number and in citation, so we consider task interdependence as a positive moderator on the effect of shared leadership on its outcomes.

### 2.6 Outcomes

The outcomes block is the last block of our theoretical framework and it indicates all the possible factors on which the shared leadership has an impact. As we have already mentioned in the previous paragraphs, the major part of the studies concerning shared leadership consider as the main outcome **team performance**. If it is true that team performance is the most investigated outcome, we have to point out, however, that it is not the only output studied by the literature. Many others were investigated in different articles, such as **client satisfaction** investigated by Carson et al., (2007). They found that teams that rely on a shared leadership style performed better than those team in which the shared leadership was scarce, but most importantly, this finding was based on performance ratings provided by clients who focused on the quality of a team's final product rather than on its process and functioning, thus being satisfied only when the quality of the product was high. Hoch, (2013), as already mentioned afore, in one of her articles directly linked shared leadership not only with enhanced team performance, but also with **business innovation**, Pearce and Sims (2002) related shared leadership with **organizational effectiveness**, Ensley et al., (2006) investigated on the effects of shared leadership on the **firm financial growth**, with a particular focus on new ventures, while Buchanan et al., (2007) focused on the culture of the healthcare sector, linking shared leadership to a **more innovative and participatory culture**.

### 2.7 Shared leadership theoretical framework

Combining the different blocks that we have analyzed so far, the resulting theoretical framework presents as it follows.



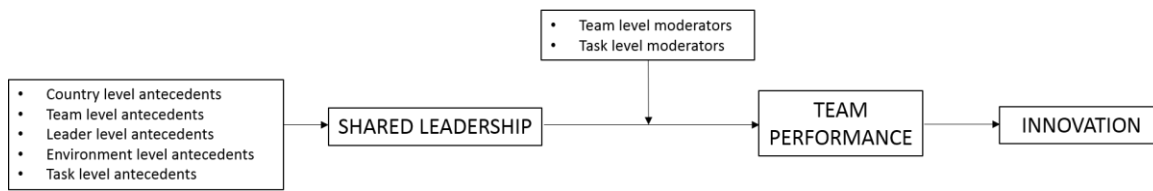


Figure 16: Shared leadership theoretical framework

The first block is composed by the antecedents, at different levels: the antecedents impact on shared leadership as they precede it in terms of time, plus they are conditions that in most of the cases are essential in order for the shared leadership to develop.

The second block is the block related to the concept of shared leadership: it contains all the different definitions that we have exposed in the introduction. The third block represents the two classes of moderators, namely those variables that influence (potentiate or diminish the effects that shared leadership has on its outcomes).

The fourth block represents the most investigated outcome related to shared leadership, that is, in fact, team performance. As we stated above, team performance is not the only outcome related to shared leadership, but being the most analyzed we decided to represent it in the framework. The fifth block represents innovation, which we consider a sub-category of team performance: in fact innovation can surely be the main objective that a team wants to achieve.

The arrows that link the different blocks represent the relationships between the blocks. They can be interpreted as it follows: antecedents have an impact on shared leadership, and shared leadership has an impact (usually positive) on team performance. The arrow related to the moderators can be interpreted as the impact on the impact that shared leadership has on team performance.

### 2.8 Dual leadership literature review

What we have done so far with the Literature Review and with the elaboration of the scheme was to create a theoretical framework that could summarize what has been written until now on shared leadership.

What we are going to do now is a review of the literature specifically on a variant of shared leadership called dual leadership. The objective of this part of the thesis is therefore to verify whether part of the theoretical framework elaborated for shared leadership can work also for dual leadership. Additionally, we want to verify if there are specific variables of shared leadership that can be related to dual leadership and if innovation can be considered a privileged outcome for dual leadership. In other words, we want to verify that the theoretical framework regarding shared leadership that we outlined above can be expanded and can be connected to dual leadership.

Since the beginning of the twenty-first century, the literature on dual leadership begins to multiply, finding fertile ground especially in the health care and education sectors. Indeed, these are the two areas in which most of the dual leadership studies are conducted. The concept of dual leadership was introduced in 1999 by Heenan and Bennis which defined co-leadership as a system driven by two people, equally positioned, who share the same responsibility of leadership. Starting from the concept of dual leadership stated by Heenan & Bennis, Klinga et al. (2016) during their investigation into co-leadership in the integrated health and social care areas, identified essential **preconditions** (antecedents) in fulfilling the management assignment, its operationalization and impact on the performance. In order to make dual leadership effective, Klinga et al. (2016) identified a set of rules that the co-leaders have to respect. Those rules can be summarized as it follows:

- Perceiving the management role as a **collective** activity
- Having a **common** understanding of the purpose

- Being interested in and willing to invest time in **collaboration** and in **learning** about each other's responsibilities
- Responsiveness, lack of prestige and self-confidence
- Interaction abilities and transparency
- Having the ability to **rely on one's leader-colleague**, allowing one to be influenced by him or her
- Being able to **compromise**
- Openness and constant **communication**
- Creation of a trustful and loyal **relationship**, as the confidence that emerged from **trust** and **loyalty** provided a space for mistakes to be made without jeopardizing the relationship
- Willing to "give and take" and occasionally even "step back"
- Involve all the members of the team in the most important decisions in order to establish a feeling of solidarity among the team members.

It is possible to notice that all the rules proposed by Klinga et al. are only facets of a wide, more important, single rule: the creation of a relationship in which the two leaders collaborate, respect each other and together move closer to each other.

Faithfully applying these rules, co-leadership can be beneficial to the whole organization: as stated in Klinga et al., (2016) "Joint decision-making was described [by co-leaders] as something that could be challenging, especially if one's previous experience was being a single manager. However, the difficulties related to acting as part of a co-leadership team are outweighed by the advantages, in terms of self-development and the sense of confidence which derives from never being alone. Co-leadership was also said to provide the advantage of immediate guidance and mentoring from one's leader colleague. The support they gave one another was described as resulting in more robust management and, thus, as contributing to the provision of sustainable, health and social care". They also state that the positive results of the application of dual leadership in

the healthcare and social care contexts can go beyond those fields and that dual leadership can be applied to different areas, turning out to be a managerial solution suitable for helping managers with challenges in complex organizations. Also Eckman and Kelber, (2009) focused on traditional leadership models vs co-leadership models, this time in the scholastic field. They took a sample of 102 female principals: 51 female traditional principals and 51 female co-principals, and they investigated their level of role conflict and job satisfaction. The article talks about how the use of the co-principals structure can help mitigate the role conflict and improve the job satisfaction of the interviewees. The traditional principals in this study reported more role conflict in their personal lives than the co-principals: this is because co-principals can better balance work and personal life. Furthermore, the co-principals in the study reported higher levels of job satisfaction compared to traditional single principals. "Co-principals were more satisfied than the traditional principles with their ability to meet students' needs, have relationships with co-workers, engage in career and professional growth opportunities, and experience pride in their schools' reputation and goals". Also "Co-principals have time to participate in the activities of their schools without feeling overwhelmed".

Of course, there are positive and negative aspects in both leadership models (traditional and co-principal), for example the traditional leadership model, which contemplates a single leader in office, is characterized by the fact that the leader is totally alone, and that all decisions (right or wrong) fall only on him/her. On the contrary, co-principals divide their authority and responsibilities, making decisions as a team, without ever feeling alone.

It has to be noticed though there are not only advantages in being in a couple: in fact difficulties in sharing power and leadership emerge, for example, the use of time and effort in the consultation and meeting the partner for any decision.

However, according to this study the advantages of being in two "offset any difficulties that occurred when two leaders must develop and maintain working

relationships as they divide job responsibilities and share decision-making”. Zander & Butler, (2010) started from the concept that nowadays working in a team is not "the management fad of the month but the contemporary *modus operandi*": often the teams are also multicultural, that is, they are more complex and therefore very stimulating for leadership research. By identifying two dimensions, namely “focused” versus distributed leadership” and “vertical” versus “horizontal leadership”, the two researchers developed four different leadership models: single, paired, rotated and shared.

In the paired leadership it is explained that the leadership activities are implemented not by a single individual, but by two people who share these activities, thus the two leaders are placed on the same level and they both the same decision-making power. According to the authors, but as we also stated afore in this elaborate, paired leadership is the preferred leadership form in academia, “where we often experience two co-editors, two-track chairs, or two project leaders” (Zander & Butler, 2010). The paired leadership can also be found in "enlightened" and "egalitarian" organizational contexts since it goes against the traditional concepts of authority linked to the single man in charge. Krause et al., (2014) studied the circumstances why organizations decide to structure with two CEOs and to explain the effects of power differences between co-CEOs on firm performances. In the authors’ opinion there are four main circumstances why firms decide to have two CEOs at the top:

- merger,
- family connection between company leaders,
- presence of co-founders atop a firm’s hierarchy,
- response to exigent circumstances.

However, the most important result of this research was to identify a curvilinear relationship between the existing power gap between the two CEOs and the performance of the company: the power gap between co-CEOs exhibits a curvilinear relationship with firm performance, such that the relationship

becomes muted as the power gap grows.

Our fundamental references for the analysis of paired leadership in organizational contexts were Hunter et al., (2017), who, using the conservation of resources theory, proposed dual leadership as a possible solution to the challenges of innovation.

What is explained in the article is that the innovation process generally requires the person in charge to take on the roles of exploration and exploitation. Exploration refers to all those activities that aim to learn something that is not familiar to the company and, if necessary, import them into company routines, while exploitation refers to maximizing the use of resources already present within the organization. The result of this dual effort inevitably produces stress and strain in the leader: so, one possible solution that Hunter et al. proposed is simply the addition of a second leader with whom it is possible to split the roles and the responsibilities.

The benefits that, according to the authors, are attributable to the fact of being a pair in the lead are many: from the attribution of the role of exploration to one of the leaders and that of exploitation to the other, to the possibility of referring to one another person for cognitive resources and emotional support, to the clarity of the messages that are transmitted to the subordinates by the two leaders together. All these elements together lead to a more favorable climate for the development of innovation.

Now that we presented the different variables that characterize the shared leadership and dual leadership models, in order to conclude the first part of our research, we present a single theoretical reference scheme that integrates internally both the analyzed models.

## 2.9 Dual leadership theoretical framework

Given what has been said above about the dual leadership style, we decided to provide another schema, in addition to the one presented in Figure 9, so to

compare the two leadership models in order to understand what are the difference and the points of parity between them. So, to the theoretical framework presented above, we add the dual leadership framework which presents as it follows.

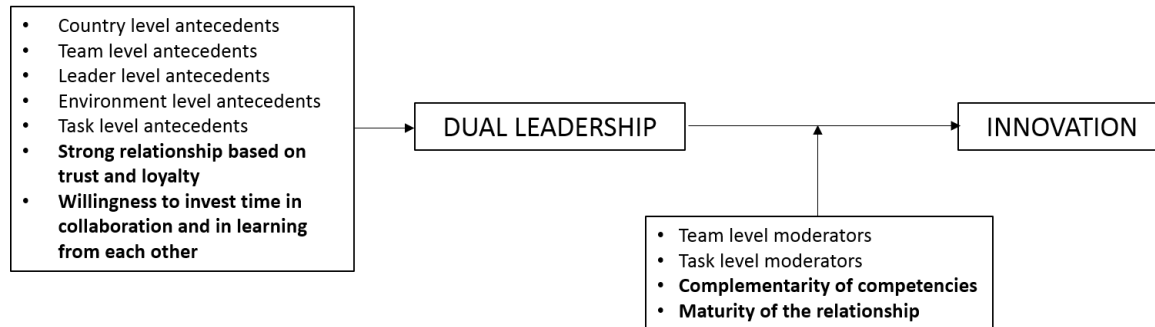


Figure 17: Dual leadership theoretical framework

It is possible to notice that the blocks of the partial scheme concerning shared leadership that we presented in Figure 9 have not been modified, but only integrated with those blocks concerning dual leadership: starting from the reading of the literature, in fact, we were able to identify some specific blocks that are related precisely to dual leadership.

First of all, to make it clear that dual leadership is a variant of shared leadership, we draw an arrow starting from the block of shared leadership, thus linking it to the dual leadership block. We then added the blocks related to the antecedents and the moderators of dual leadership and finally the block related to the outcome, which in the case of dual leadership we defined as innovation. We considered dual leadership as a variant of shared leadership as the elements that compose the two leadership models are exactly the same: both shared and dual leadership, in fact, have their specific antecedents, moderators and outcomes.

In building this expanded theoretical framework, the review of the literature was very helpful in particular for identifying antecedents and outcomes of dual leadership. In fact, as stated by Klinga et al., (2016) for the introduction of a dual

leadership model in an organization some preconditions have to be respected. We consider as the two most important antecedents the creation between the two members of the pair of a strong relationship based on trust and loyalty, and the willingness of the two to invest time in collaboration and in learning about each other's responsibilities.

The review of the literature was really helpful also in identifying the outcomes of dual leadership. It in fact appears clearly from the papers of Hunter and Shenk that innovation can be considered the privileged outcome of a dual leadership style: however, beyond the researches conducted by Hunter and Shenk, there are no other particular studies that directly link dual leadership with innovation. Conversely, for what concerns the moderators of dual leadership, the literature did not really help us: we did not find any variable in the literature that we can clearly consider a moderator of the effect of dual leadership on its outcomes.

### 2.10 Research Agenda

Concluding the Literature Review, before illustrating the objectives of the empiric part of our thesis, we now want to point out some observations about the state-of-art research on shared leadership that we understood are useful also to describe its dual leadership variant. As we have mentioned above, shared leadership intended as the recently born organization of teams in which the leadership roles and the decision making power are distributed among team members (Carson et al., 2007) has been investigated until now in different fields. Shared leadership pointed up the importance of team members in team leading processes (Carson et al., 2007; Pearce & Conger, 2003). We observed that shared leadership is effective in increasing team performances (Pearce, Manz, & Sims, 2009; Wang et al., 2014) and in switching the leadership paradigm from the traditional vertical leader to a horizontal and distributed process.



Being shared leadership a rather recent topic in the literature, it is still not well defined under different aspects, specifically:

- As we said in Chapter 1, the literature does not agree on a single definition of shared leadership: “Over the years, the literature has become quite disjointed with a proliferation of nomenclature and conceptualizations” (D’Innocenzo et al., 2014). As pointed out in different ways by Carson et al., (2007), Day, et al., (2004), Nicolaides et al., (2014) and Wang et al., (2014), there is not a unique idea of what shared leadership is and no unified theoretical framework that clearly shows how shared leadership emerges and develops over time. In fact some definitions, to distinguish shared leadership to the traditional leadership, rely on the number of people involved in leadership activities (Ensley et al., 2006), while other definitions rely on the source of leadership influence (Zhu et al., 2018). So, what is missing in the literature is a consistent and clear definition of what we can call shared leadership: what we have to date are different possible interpretations of shared leadership as well as different methods for measuring it.
- Shared leadership is operationalized in different ways: some authors measure it focusing on the level of engagement of team members in leadership behaviors (e.g., Pearce & Ensley, 2004) while others aim to capture the level to which leadership is decentralized (e.g., Mehra et al., 2006). The lack of a universally accepted definition and the presence of different possible ways of measuring shared leadership can cause significant divergences in the results in terms of the effect that shared leadership has on the same outcome across different researches (D’Innocenzo et al., 2014).
- The literature that deals with the analysis of the antecedents, moderators, and outcomes of shared leadership is discontinued and fragmented (Zhu

et al., 2018). The literature still misses an inclusive framework that summarizes all the variables that play an important role in how shared leadership is born, how it develops and how it impacts on team processes and final performances.

In our thesis, we are going to focus on this third point: thanks to the frameworks that we built in fact we are now able to offer a general vision of what shared leadership is. The framework has both theoretical and empirical relevance since it provides a view of the current situation that can be used as the starting point for future researches on shared leadership. Given the fact that is difficult to overcome the problem of the different measurements used for shared leadership, the analysis that we are going to perform in the second part of the thesis will be mostly descriptive and aimed at finding clusters and patterns that help in describing the dynamics through which shared leadership emerges and develops between two individuals.

### 2.11 Research objectives

Given the shared leadership Research Agenda, we now propose to set up a bunch of main objectives that allow us to investigate more deeply the link between dual leadership with innovation. So, in the second empirical part of our thesis we will go deeper into the relationship that links dual leadership with innovation in order to precisely:

- enrich the strand of literature that links dual leadership and innovation to partially bridge the research gap on the link between dual leadership and innovation. We will do this by exploring the concept of innovative couples thanks to the rich database of projects undertaken by 50 couples in the Lombardy region provided to us by the Milan Polytechnic, to
- investigate whether in our sample of innovative couples Complementarity of Competencies and Maturity of the Relationship can be considered as

moderators of the link between dual leadership and innovation. As we said above, we did not really find any specific variable that the literature clearly considers a moderator of the effect of dual leadership on its outcomes, however, we want to investigate if the two mentioned variables can be considered moderators given their importance emerged from the literature. Fausing et al., (2015) and Muethel and Hoegl, (2016) in fact have deepened respectively the concepts of complementarity and of the respect of the competencies inside the team, while Wu et al., (2018) and Nicolaides et al., (2014) wrote about the concepts of team maturity and team tenure.

Finally, we will go deeper into the relationship that links dual leadership with innovation in order to

- understand the dynamics which establish among the members of a couple who decide to undertake a business project together: specifically we want to understand what is the reason that leads a couple to form and to maintain over time and what are the effects of working in pairs on the outcomes. Starting from the investigation on the link between dual leadership and innovation, we therefore investigate how pairs decide to join and to pursue a common objective. By doing this we explore new avenues for research on dual leadership and its impact on innovation.

We believe that the database made available to us by the Politecnico di Milano can be a great source of inspiration for understanding and describing the couple dynamics. In fact, in the database there are projects undertaken by 50 couples in the most disparate areas, but whose common denominator is the fact that they have profoundly innovated their reference sector.

So, the empirical part of the thesis will be characterized by the analysis of the database of couples in order to deepen the knowledge of the “couple” entity, to study innovation as an output of the couple’s activity and to try to identify specific moderators of the dual leadership, that is to say the variables that impact

on the relationship between dual leadership and innovation.

We believe that our research can be appreciated both at a theoretical level, since there are research gaps on the topic, and at a managerial level, since the results of our research can be used as a reference for all those managers who are considering the idea of introducing a co-leadership model in their leadership practice.

### 3 Introduction to the couples database

What we are going to do in the second part of this paper is to empirically investigate some factors that have been anticipated above. We are going to use as information the data stored in the pairs database that has been made of the projects of 50 couples of innovators for the “Genio e Impresa” exhibition which aim was to answer the question "Where does innovation come from?".

The intuition that the research team of Politecnico di Milano had, and that we are going to deepen with our research, is that innovation, especially the most radical, is born in pairs.

The exhibition was available to the public from July to September 2019 at Palazzo della Regione Lombardia in Milan, and it was organized by Assolombarda with the partnership of Politecnico di Milano, more precisely with the partnership of the Leadin’ Lab, the laboratory for Leadership, Design and Innovation at the School of Management of Milan Polytechnic, whose mission is to help leaders to create meaningful innovations and transform organizations.

The study of the pairs of innovators in Lombardy and the exhibition “Genio e Impresa” are part of the events organized by the city of Milan for the 500th anniversary of the death of Leonardo Da Vinci, the undisputed Italian genius who lived in Milan during the reign of Ludovico Sforza, known as "Moro".

So, the second part of the thesis is characterized by the description and the analysis of the database built for the “Genio e Impresa” exhibition, and of its related variables.

### 3.1 The couples database as a mean to explore our Research Agenda

The reason we decided to analyze the database is to empirically investigate the research questions we asked ourselves at the end of the previous chapter: using the database in fact it is possible to better describe the entity “couple”, which is the fundamental unit of analysis of the dual leadership model.

Moreover, by correlating the different characteristics of the couples with each other and then using the resulting aggregated data it is possible to make a more in-depth analysis regarding the causes for which the two members of the couple decide to work together and the effects that working in pairs brings on the outcomes.

We are guided by the conviction that only by analyzing couples empirically it is possible to fully understand the dynamics that form in the couple and understand the profound motivation for which two people decide to undertake an entrepreneurial adventure together. Moreover, we are curious to understand if all the pairs form differently or if in their creation some patterns can be repeated and therefore unite more couples.

Finally, we want to analyze the database of couples because all the projects undertaken by the couples included in it are excellent examples of innovation in the most diverse fields. The database is in fact made up of 50 projects that are very different from each other, both as regards the areas of application and as regards the skills of the individuals who compose it. We therefore consider extremely useful the analysis of this specific database because we think it can be an excellent proof that innovation is the privileged outcome of the dual leadership model.

### 3.2 Overview of the database

First of all, in order to better understand the starting conditions of the empirical analysis we intend to carry out, it is proper to specify more in deep what is the nature of the data collected in the pairs database.

All the data contained in the database are purely qualitative since only a few fundamental characteristics of the couples described therein are analyzed, such as the name and gender of the two components and the scope of application of the innovation they brought to the market. The analysis that derives from the qualitative data provided by the database is also qualitative, based therefore on the description of the processes that establish between the two members of a couple of innovators who decide to collaborate on a project. As mentioned before, the data which compose the database are referred to projects undertaken by couples specifically in the Lombardy region. So, we can safely state that all the data refer to projects that have the characteristic to be conceived in the same geographical area, which is exactly the Lombardy region. It is no coincidence that the region chosen for an exhibition that speaks of genius and business is Lombardy: the city of Milan in fact, but more in general Lombardy, is certainly the most important center of innovation in Italy. This is where that innovative Start-ups, incubators and accelerators are concentrated, this is where large amounts of capital are invested in research, this is where companies feel they can invest in innovation. In essence, Lombardy can be defined as a sort of "garden of wonders" where it is possible to produce innovation, that is essential for the future of Italian and non-Italian companies. The mechanism of the investments of capital in innovation is a virtuous circle that is self-sustaining, bringing Lombardy to have extraordinary numbers in comparison to other Italian regions. According to the words of Carlo Bonomi, President of Assolombarda (the association of companies operating in the provinces of Milan, Lodi, Monza and Brianza), Lombardy is an ecosystem that invests in research and development € 4.8 billion, equal to 21 percent of the

Italian total. Also, Lombardy concentrates 32 percent of patents and 33 percent of the total percentage of people employed in the advanced manufacturing sectors at a national level, it also concentrates 13 internationally recognized universities, 27 percent of the most cited Italian scientific research at a global level and over 15 thousand Start-ups at high knowledge intensity.

Given these numbers, which confirm a culture that is highly prone to innovation in Lombardy, we can therefore say that innovators, at least in Italy, find more fertile ground to operate in Lombardy rather than in other Italian regions. It is for this reason that we believe that our database is very representative of the situation of innovation in Italy and that the data contained therein are very interesting to analyze in order to better understand the role of entrepreneurs who want to get involved and invest in innovation in our Country.



## 4 Methodology: data collection

### 4.1 Introduction to the chapter

This chapter illustrates the methodology that Politecnico di Milano used in order to collect the original database of couples used for the exhibition “Genio e Impresa” and the methodology that we used in order to collect additional data for the database of couples. The chapter is structured as it follows:

- Paragraph 4.2 illustrates the methodology steps that the Leadin’ Lab of Politecnico di Milano made in order to group information about 50 projects undertaken by 50 couples that formed the original database. In this paragraph, it is also illustrated the supplementary information that we added to the original database.
- Paragraph 4.3 provides some descriptive statistics about the database, in order to give the readers a better perspective of the sample of data that we are going to analyze in the next chapters.

### 4.2 Methodology steps

The second part of this study is characterized by being an empirical analysis of the data included in the database. As mentioned above, the database was originally created in order to group the description of the 50 different projects undertaken by the 50 couples presented in the exhibition “Genio e Impresa”, held in Milan from July 2019 to September 2019.

The database thus composed by Leadin’ Lab from Politecnico di Milano was perfect for the exhibition, however, it is not very complete for our research: in fact, only a few aspects concerning the couple of innovators and their relationship are described. This is totally understandable considering the purpose

## Methodology: data collection

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of the exhibition: the objectives of the exhibition were in fact to make clear first of all the innovation brought by the couple and secondly the relationship of the couple with the Lombard territory.

What we need to do now is therefore to add to the database new information that can be useful to answer our research questions.

Starting from the work that has been done by Politecnico di Milano, so from the very origin, the database of couples is built in three separate steps.

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1	Open call launched by Politecnico di Milano
2	Skimming following the criterion of innovation brought by a collaborative couple
3	Addition of useful information to answer our research questions

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### 1. Open call launched by Politecnico di Milano

The database was initially created for the “Genio e Impresa” exhibition by the Milan Polytechnic team. As previously stated, the purpose of the exhibition was to celebrate the fertility of the Lombard territory when it comes to innovation. The idea of the Polytechnic was to draw attention to the couples of innovators who worked in the Lombard area, starting from the couple par excellence, which is the one formed by Leonardo and Ludovico il Moro in the second half of the 1400s.

So, recalling Leonardo da Vinci's relationship with his Milanese patron Ludovico il Moro, the Politecnico di Milano team, in collaboration with Assolombarda, in January 2019 launched a public call to find modern pairs of innovators in the Lombardy region. The deadline of the call was established to be on March 2019.

The “open call” was published on social media and in the press and answered more than 130 couples, coming to a total of 273,000 people reached through the web, social media and media. A total of 132 applications were received in response to the open call.

## 2. Skimming following the criterion of innovation brought by a collaborative couple

The second step was to evaluate and give a first skimming of the spontaneous candidacies to the open call. The result of the open call was the application of 132 couples. Those couples were then skimmed using objective measurements, such as:

- Territoriality: only the couples which operate in the Lombardy region were accepted,
- Pairs: only the applications which effectively contained a project lead by two people were accepted,
- Innovation: only the applications containing an innovative project were accepted,
- The ownership of one or more patents was considered a nice to have factor in order to be accepted,
- The impact of the innovation in terms of countries of operation and turnover for the owners.

Only 50 couples of the 132 which applied were chosen following the criterion of how effectively the innovations presented were collaborative innovations of the couple.

So, the original database that was delivered to us by our supervisor was set up to report:

- the name of the innovative reality or of the project implemented by the couple,
- the description of the innovation that the couple brought to the market,
- the names of the two members of the couple,
- the gender of the two members of the couple,
- the scope of application of the innovation.

### 3. Addition of useful information to answer our research questions

The database created for the “Genio e Impresa” exhibition is a great starting point, but it does not contain enough information to answer our research questions.

So what we have to do now is to structure the database with additional information considering variables and characteristics that are, according to our opinion and to the previous research on the literature, interesting and meaningful in order to analyze the 50 couples from a dual leadership perspective. In particular, the features that we consider interesting to add and analyze are:

- the **role played** by the two members of the couple in the innovative reality (CEO, COO...) to better understand what kind of work relation elapse between the members of the couple,
- the fact of being **co-founders** of innovative reality or not: in particular we want to analyze if there are some common characteristics between couple who are co-founders or if it is just an economic matter,
- if the innovative reality operates in a **Business to Business** (B2B) sector or in a **Business to Consumer** (B2C) sector,
- if the innovation falls under the definition of **Market Pull**, **Design Push** or **Technology Push**. Innovation in fact can have different origins and mechanisms for its development: given that innovation can be born in different ways and with different methods,

- if the innovation brought to the market by the couple belongs to the category of **product innovation** or the category of **service innovation**,
- the **type** of innovative reality. We consider three different types of innovation: innovation that is born inside a Company, innovation that gave birth to a new Startup and innovation that is characterized by a particular form of collaboration that we are going to explain later in the text (Hybrid),
- the **number of employees** of the innovative reality, if created,
- the **complementarity of skills** between the two members of the couple: we base our categorization on the basis of their past studies and their experiences in order to state if they have complementary skills and competencies or not,
- the **age difference** between the two members of the couple,
- the indication of the **Maturity of the Relationship** between the two members of the couple.

Now that we have explained how the database has reached in time a level of information that can be used for the purposes of our research, we propose some descriptive statistics in order to offer readers a more complete perspective on the data we will analyze.

### 4.3 Descriptive statistic of the database

The first information added is the discrimination about gender: our previous readings about dual leadership and innovation in fact led us to think that it is proper to illustrate how our sample of 50 couples is divided in terms of gender heterogeneity. This variable is reported also in the literature, as Kukenberger and D’Innocenzo (2019) state: “(...) gender stereotypes seem to play a critical role in the leadership granting process due to: socialization and role development (Eagly & Karau, 2002), the development of gender-related social status (Ridgeway, 1997;

Ridgeway & Balkwell, 1997) and cognitive processes related to social categorization (Heilman, Block, Martell, & Simon, 1989; Lord & Maher, 1991).”

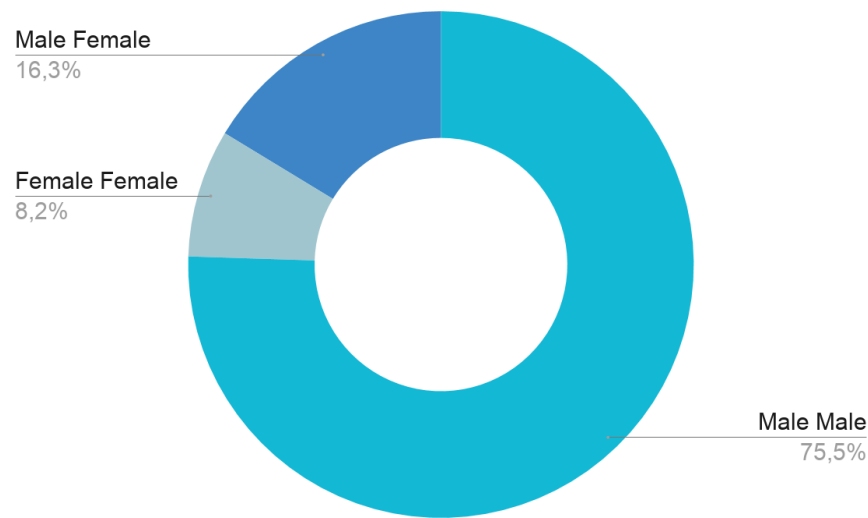


Figure 18: Gender composition of the couples in the database

As it is possible to notice from the graph, the major part of the couples is formed by two components which are both male (75,5%), while only 8,2% of the total sample represents couples which are composed of two female members. Slightly higher is the percentage of couples characterized by mixed-gender (16,3%). Looking at this graph it could perhaps be deduced that it is more difficult for women to propose innovation, since three-quarters of the sample shows pairs made up only of male members. However, we believe that the high percentage of couples made up of two male components is only a case and that in the Lombard context women are absolutely not hindered in undertaking an innovative entrepreneurial path.

A second variable that we consider particularly worthy of attention is Age difference: as we reported before, age diversity has an important impact on team results. Given that the literature already found that the difference in age can affect the results of shared leadership, we want to consider also the age of the members of the 50 couples constituting the database.

We assume that the two members of the couple pertain to the same generation if their distance in age is lower than 8 years, while if the distance in age is higher than 8 years we assumed that the members of the couple belong to different generations. The chart below shows the distribution of the variable “Age difference” between its two possible statuses: Different generation and Same generation.

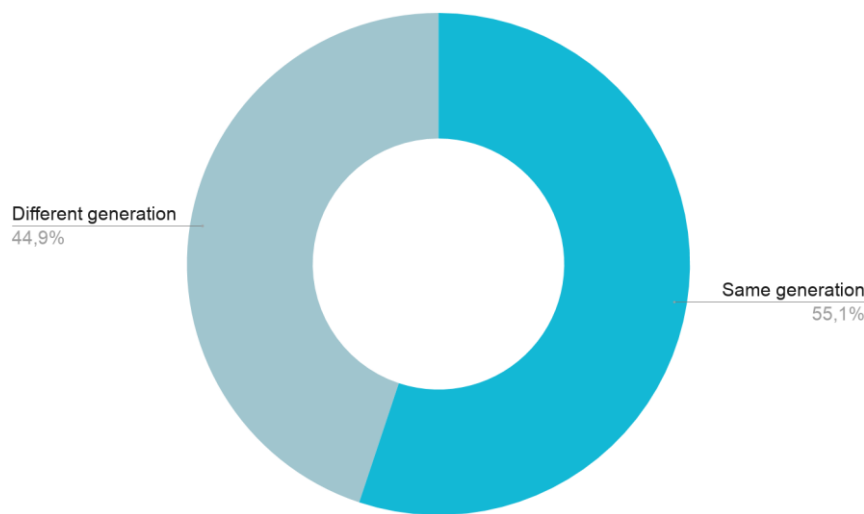


Figure 19: Generation composition of the couples in the database

In the distribution of the pairs between Same generation and Different generation there are no particular polarities: the couples whose members belong to two different generations are 44.9% of the total, while the couples whose members belong to the same generation are 55, 1% of the total. Often couples belonging to the same generation are those whose members met during their school years, while couples who belong to different generations are the ones who met later in life, for example during their working life.

The last peculiar characteristic of the sample of couples that we would like to highlight is related to the type of innovation that the couples brought to the

market. In particular, in order to grab a general overview of the sample, we find convenient to discriminate between B2B markets and B2C markets as well as to check if the couple brought to the market a product innovation or a service innovation. The result of the cross between the two variables B2B/B2C and Product innovation/Service innovation is the following.

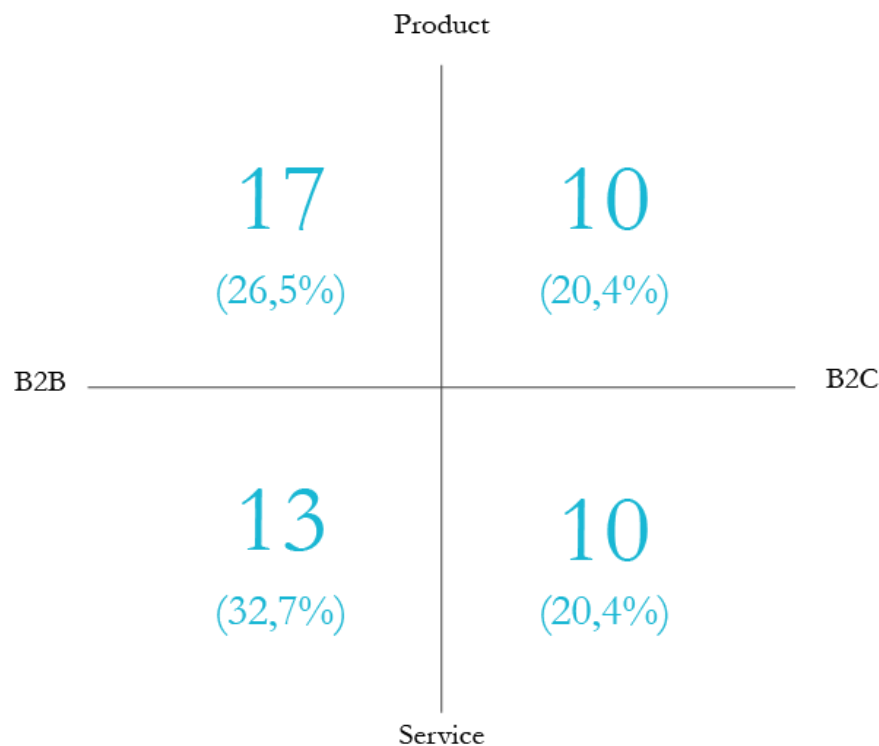


Figure 20: Cross between the variables B2B/B2C and Product Innovation/Service Innovation

Also in this case the pairs are well distributed through all the four quadrants: there is only a majority of couples who brought innovation to the product in the B2B environment (17 couples).

However, analyzing the data in the column it appears a more relevant aspect, namely that most of the couples in the database prefer B2B perspective to the B2C one. In fact 59.2% of couples (given by the sum of 26.5% and 32.7%) developed a B2B innovation, while 40.8% of couples worked in a B2C perspective.



As regards instead a data analysis by line we find that 46.9% of couples have implemented a product innovation, while 53.1% of couples have implemented a service innovation.

As it is possible to notice from the descriptive statistics that we have just offered, the sample of couples is very heterogeneous: we think that having such a diversified sample is a good starting point since it can be very interesting to investigate how the couples differently behave, but most importantly what do they have in common.

## 5 Methodology: data analysis

### 5.1 Introduction to the chapter

This chapter is about the description of the three variables that we decided to describe given their importance, confirmed by their presence in the past literature that we have reviewed.

There is only one paragraph divided into three subparagraphs that correspond to the three analyzed variables, namely:

- Complementarity of Competencies,
- Maturity of the Relationship,
- Entity type.

### 5.2 Modeling variables

During the phase of the expansion of the database, the shared leadership theories extrapolated from the literature gave us some important insights for the analysis of our 50 couples of innovators: in fact during the reading of the literature, we found out many variables that seem to have an impact also on dual leadership.

What we want to do now is to take into consideration the most important ones, those that were mentioned repeatedly by different authors (usually with different names) to use them in order to analyze the couples in our database.

The fundamental pillar that guides our analysis is that we truly believe that “Under the right conditions, two corporate heads can be better than one, both for the company and the individual partners” (Alvarez, 2007).

We find as particularly relevant for our analysis three variables, that we name as it follows and that we are going to explicate in the following paragraphs:

- Complementarity of Competencies,

- Maturity of the Relationship,
- Entity type.

### 5.2.1 Variable 1. Complementarity of Competencies

A famous saying states that opposites attract: it can also seem very intuitive for us to say that if someone wants to build up a new venture from scratch, like many of the couples in our database, he/she will probably look for someone who has complementary skills in order to perform better than he/she would do alone. It is exactly for this reason that the first variable we want to take into consideration given our database was **Complementarity of Competencies**: that is to say the skills and the competencies of the members of the couples and the characteristics of those couples which have complementary competencies.

The literature helped us in finding theoretical references: Kukenberger & D’Innocenzo, (2019) found that team diversity, in the meaning of informational and functional diversity, has a positive direct impact on shared leadership and performances. Pearce and Conger, (2003) proposed that “as members bring diverse knowledge, perspectives, and characteristics, they create a foundation conducive for leadership to be distributed across the team.”

Also Hunter et al., (2012) arguing about the relationship between Steve Jobs and Steve Cook, stated that Cook was calm and steady, while Jobs was known for his “passion and unpredictable temper”. Moreover they stated that: “Many large scale innovations require leaders with divergent and specialized skill sets” and that “partnerships can allow for greater evaluation and refinement of the idea”. So, complementarity appears to be one of the most important characteristics for dyads, and above all an important criterion to take into account while looking for a co-head, as “co-leaders need to have balancing expertise, experiences, skills, styles and networks in order to operate successfully” (Alvarez et al., 2007).

Alvarez et al., (2007) pay great attention to complementarity and they place it at the top of the conditions for successful cooperation together with compatibility

and commitment. So, referring to the literature, we can state that complementarity of skills between leaders has been studied in many documents, highlighting it as a fundamental characteristic that directly and positively impacts the performance in a shared leadership contest.

Our goal is to understand if the correlation between complementarity of skills and improved performance exists and if it works also in the case of pairs. In order to verify the complementarity of skills of each of the 50 couples, we have to make a research about the past experiences of each member of the database. Looking at their stories (especially on LinkedIn and on their personal websites) we can understand their cultural background, what and where did they studied and their past work experiences in order to be able to state if they actually have divergent competencies.

The result of this activity is the division of the database between Complementary and Overlapping couples. We mark as “Complementary” 39 out of 50 couples (77,6%): the couples that do not fall under the “Complementary” tag take the “Overlapping” label, meaning that the skills that characterize the two members of the couple are mostly overlapping.

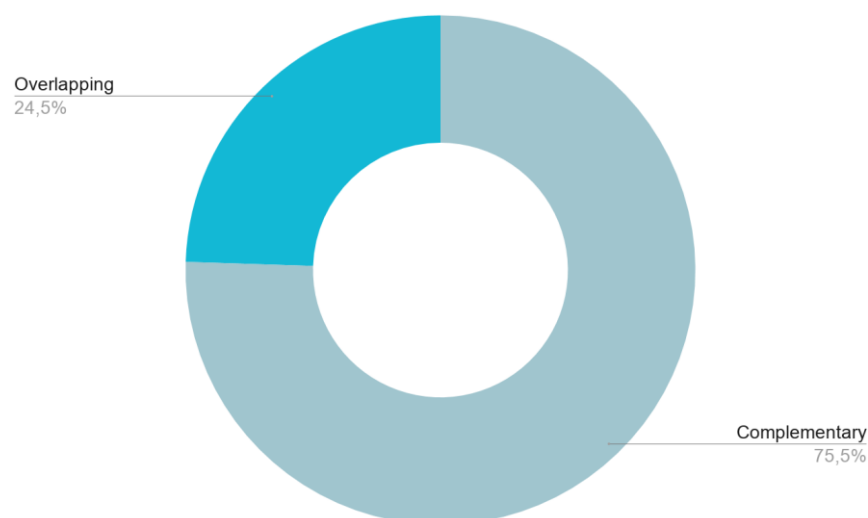


Figure 21: Distinction between Overlapping couples and Complementary couples

We expected this kind of disparity in the quantity of Complementary and Overlapping couples, as the database that we use was built for the sake of the exhibition “Genio e Impresa”, which focused on the two distinct (and complementary) roles of the genius and the entrepreneur. Following these statistics, we can state that probably it is true that it is easier to work together and innovate for couples with complementary skills (since they represent the large majority of the database).

### 5.2.2 Variable 2. Maturity of the Relationship

Once established that Complementarity of Competencies is the first important variable to be taken into consideration, we now turn our interest into another set of antecedents that we think is essential to the aims of our research and that the literature as well has developed in the past researches. We are referring to those articles that argued about factors like trust, confidence, familiarity and proximity between the leaders: we wanted to summarize all those terms in a comprehensive variable that we call **Maturity of the Relationship**. The Maturity of the Relationship variable indicates the length of the relationship between the two members of the couple and their confidence level, with all its ups and downs.

With regards to our couples, we can divide them into two categories: couples in which the members had known each other from a long time before they decided to work together and couples which started to work together almost immediately when they met because their encounter was a sort of love at first sight. Pearce and Sims, (2003) argued about **maturity** and **familiarity** of group members (in our case, the two members of the couple). They stated that “if group members are completely unfamiliar with one another, it seems likely that the display of shared leadership would be diminished. Conversely, to the extent that group members are highly familiars, the existence of shared leadership seems to be greater”.

Nicolaides et al., (2014) found as a possible moderator of the shared leadership

a factor called **team confidence**, that in their opinion partially moderates the effect of shared leadership on team performance. Also, Wu et al., (2018) state that “establishing trust among team members is one route through which changes in shared leadership bring benefits to team performance”. They hypothesized that “intragroup trust moderates the relationship between shared leadership and team outcomes such that this relationship is more positive when intragroup trust is higher rather than lower”.

Taking a cue from the previous theories, we now analyze what kind of relationship characterize our couples of innovators. We try to dig deeper into the relationship between the two answering to question such as: did they go to the same university? Are they related in some way (father/son, husband/wife)? Did they have in common a passion or a hobby? How much time did they need in order to decide to work together? Most of the answers to our question can be found on LinkedIn and through the reading of the material that the couples provided for the “Genio e Impresa” exhibition.

We can therefore divide the 50 couples into two different categories, as it follows.

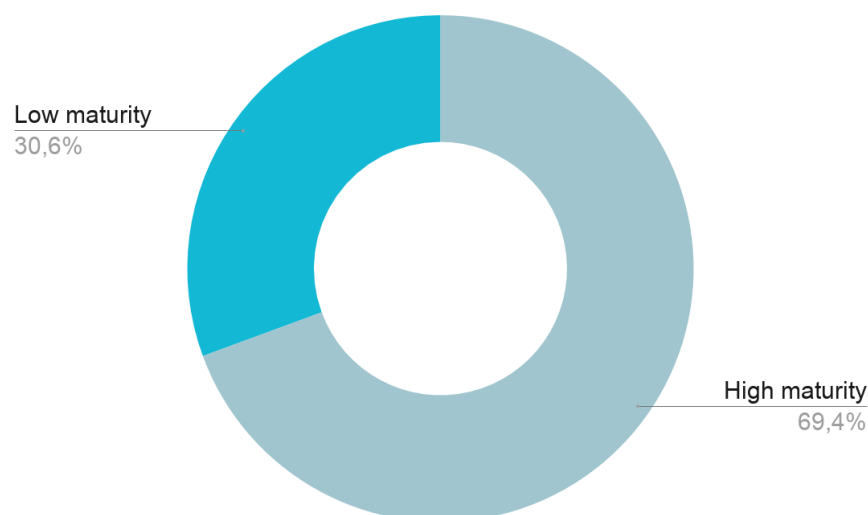


Figure 22: Distinction between Low Maturity of the Relationship couples and High Maturity of the Relationship couples

As we can see, the majority of our couples is characterized by having a High Level of Maturity: this means that before deciding to work together, they had a long and full relationship behind: some of them were colleagues, others studied together, some couples are married and some couples are friends.

According to those results, we can state that the Maturity of the Relationship variable has an impact on the outcomes (innovation) in the case of pairs, as it did in the case of shared leadership: in fact given that the majority of the couples is characterized by a High Level of Maturity in the relation, we can deduce that a High Level of Maturity makes innovating easier, because when the two people know each other and trust each other they are more likely to work together effectively.

Couples identified in the Low Maturity of the Relationship category, instead, are characterized by collaborations that sparkle in a very short time thanks to a common desire, a common sense of missing something. Even if Low Level of Maturity relationships are less in number, it is curious to know and to understand how do they formed and worked.

To make the readers better understand what we are talking about we will propose now and later in the text examples of innovation developed by the couples of our database. It has to be noted that due to privacy reasons we have been asked not to disclose the names of the companies, of the members of the couples and of the innovations, therefore all the proper nouns contained in this paper are purely fictional. In the Appendix of the text, we have reported the entire database of pairs: it should be noted that also in the database reported in the Appendix all the information reported is true except for the proper nouns of persons and organizations, which are purely a figment of the imagination. Let's take for instance the story of Alfa-Sigma: the Digital Assistant by Alfa-Sigma is a product dedicated to the guests of care facilities who spend most of the day in bed, patients who need to be monitored continuously and moved with a predetermined frequency to avoid, for example, falls, incorrect postures and

strenuous movements. Michele Invernizzi, now CEO, started to work on Alfa-Sigma in 2015, after a personal experience: his grandfather spent the last few months of his life in a hospice and he died because of the little cure and attention that the health workers dedicated to him. For this reason, Invernizzi decided to start his entrepreneurial path with Alfa-Sigma, a path that took him around the world through acceleration programs in Seattle and Dubai, where he improved his network and his capabilities. In June 2016 Invernizzi met Ettore Stella (now CTO) by chance while doing market researches online.

Stella was in fact enrolled in a Ph.D. in Biomedical Engineering at Politecnico di Milano, and in 2015, in his final thesis, he developed independently from Invernizzi, a technology to monitor the exacerbations of the health status in hospice patients.

Both Invernizzi and Stella refer to that moment as “love at first sight”: they immediately started to collaborate in the development of the Alfa-Sigma Digital Assistant.

### 5.2.3 Variable 3. Entity type

In order to better describe the couples of our database we now want to characterize them according to the nature of the entity created from the collaboration between the two members. We identify three distinct typologies of entity.

- **Company:** we label a couple as pertaining to a “Company” when the innovation brought by the couple stems from a project developed inside a company. This means, most of the time, that the two members of the couple are colleagues who are asked to work together to develop a project.

To better explain, let’s take the case of the ARIANNA platform developed by Alpha, which is a spin-off of the University of Milan that aims to find innovative solutions to deal with serious illnesses such as breast cancer. Alpha’s first platform ARIANNA is a system based on artificial intelligence algorithms for



precision medicine. The ARIANNA project was followed in particular by the couple Margherita Nucci and Filippo Longo. Nucci is co-founder of Alpha, member of the board of directors and professor of General Pathology, while Longo is co-founder, President of the Alpha Board of Directors and Professor of Theoretical Physics. Together they were able to develop ARIANNA as an important project of their Company, Alpha.

- **Startup:** there are many differences between a Company and a Startup, even if the term Startup does not have yet a specific, globally accepted definition. Usually, the term Startup indicates a company or an activity that is created to grow quickly. Moreover, in order to be considered a Startup, the activity has to represent an innovation that must have rapid and constant growth, with a scalable business model. In brief, a Startup is an organization, not totally certain in its nature, that has the duty of changing and innovating the environment.

Of course, the assets needed by a Startup are lower than the assets needed inside a company, similarly, the human resources required to accomplish all the functions is higher in a company than in a Startup.

For the purposes of our thesis, we define as Startups all those organizations that have been created from scratch for the innovation and that have registered their own legal identity.

A good example of an innovative Startup present in our database is Alpha-Epsilon: the two co-founders of Alpha-Epsilon, Carolina Bruno and Laura Bellucci, after attending to the same Design course at Politecnico di Milano, invested their time and resources in R&D until they obtained and copyrighted “Marmoreoum”, a patented membrane containing marble dust. They then co-founded Alpha-Epsilon in order to sell clothes containing the Marmoreoum membrane, that uses marble powder to give natural color and aesthetic effects, replacing the chemical pigments usually used in the textile industry.

- **Hybrid:** with the name Hybrid we indicate another type of couple where the two innovators belong to different realities. In this category we can find couples composed by an entrepreneur and a researcher, or by an entrepreneur and an artist: usually one of them works in a Company (generally is the CEO or the founder) while the other one is completely external to the company and generally has great creative skills.

In order to give a clearer understanding of what we intend as “Hybrid” let us take the example of Alpha-Omicron, present in our database.

Alpha-Omicron is a historic Italian Company founded in 1823. During the 60s, Ortensio Marchesi transformed the family Company from a dairy to a modern enterprise with a new mission: to produce and select the best cheeses from the dairy tradition and pack them in consumption units suitable for the evolution of needs and designed to be sold on the shelves of the emerging modern distribution. During the 80s, the International Scientific Community began to consider the use of gas in food packaging to extend its conservation and quality to consumers. So, in collaboration with Alessio Lucchese, a professor of the DISTAM, the Food Science and Technology department of the Milan University, Marchesi developed a modified (protective) atmosphere for the packaging of fresh grated cheese, a technology that allows the optimal preservation of the sensory characteristics of the packaged product and prevents its degradation. The result is that nowadays Alpha-Omicron is the leader in the market sector of grated cheese.

Looking back at the relationship between the couple Marchesi and Lucchese, it is possible to notice that they collaborated but they were not working in the same company neither they founded a company together: Lucchese was a scientist collaborating with an entrepreneur with the only aim to create a better product or service. It is in this way that we intend in this thesis the term “Hybrid”.

Just a few number of our couples is identified as Hybrid, since it is a very particular form of collaboration not easy to encounter: in fact usually the

scientists that develop an innovation for a company work inside the R&D department of the company itself.

Given our categorization of the different entities present in the database, this is how the 50 couples divide in terms of Company, Startup and Hybrid.

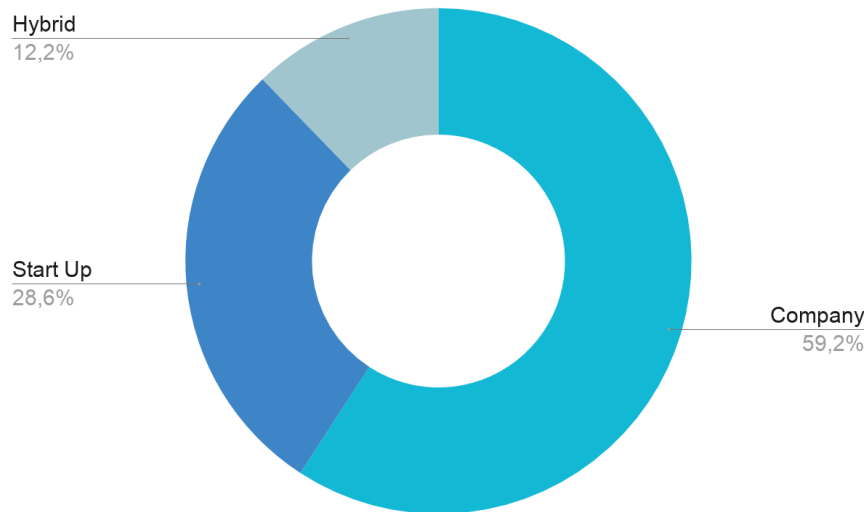


Figure 23: Classification between Hybrids, Startups and Companies of the couples in the database

As we anticipated before, the majority of the innovations reported in the database belongs to the category “Company”: 33 out of 50 couples. We expected this situation because in our opinion companies are a great environment for innovations to succeed: in fact inside a company individuals are keen to collaborate, to stay in a strict contact and to co-work for the ultimate goal of the company, that is the survival of the company itself in the market.

The Startup category is smaller in size but not in importance. Startups are the places where the most radical and disruptive innovation arise, but they have the disadvantage of requiring to the founders a higher level of effort with respect to a well-established company: resources such as new technologies and skilled

human resources are in fact very difficult to afford and to maintain for a recently born Startup.

As we said, Hybrid is a peculiar category, present only in the 12,2% of the couples in the database: still, this is the category that in our opinion best represents the partnership that stemmed from Leonardo and Ludovico il Moro that was at the heart of the exhibition “Genio e Impresa”.

Now that we have presented the three most important macro variables that, given their importance deduced from their presence in the previous literature, we want to take into consideration for our analysis, the next step is to show how to cross them together in order to analyze the existence of any correlation between them and the presence of any remark

## **6 Results and Implications**

### **6.1 Introduction to the chapter**

The empiric part of our research is based on the aforementioned three variables that we described as noteworthy: what we will do now is to cross them together in order to better frame their impact on the couples and on the innovation they bring.

The chapter is structured as it follows:

- Paragraph 6.2 provides a brief introduction of the two intersections of variables that we decided to perform.
- Paragraph 6.3 illustrates and comments the first cross, namely the cross between Maturity of the Relationship and Complementarity of Competencies.
- Paragraph 6.4 illustrates and comments the second cross, namely the cross between Maturity of the Relationship and Entity Type.

### **6.2 The two crosses of variables**

As we just mentioned, we will now show the two crosses of variables that we:

- Complementarity of Competencies with Maturity of the Relationship: in order to understand if these two variables influence each other and if they create an important cluster that deserves a deeper analysis,
- Maturity of the Relationship with Entity type: here we want to focus our attention on a more organizational/managerial aspect: we in fact focus on the relationship between the two members of the couple and on the

different kinds of innovation that can occur given different kinds of relationships between the two innovators.

### 6.3 Cross 1. Maturity of the Relationship – Complementarity of Competencies

Crossing the first two variables, we aim to establish a connection between Complementarity of Competencies and Maturity of the Relationship in order to understand if there is a correspondence between them and to verify if they have an impact on the couples of the database.

So, having analyzed one by one the different couples of the database and having assigned them the characteristics of high/low-level maturity and complementary/overlapping skills (as it is possible to notice from the database itself, provided in Appendix) the result is summarized in the following graph.

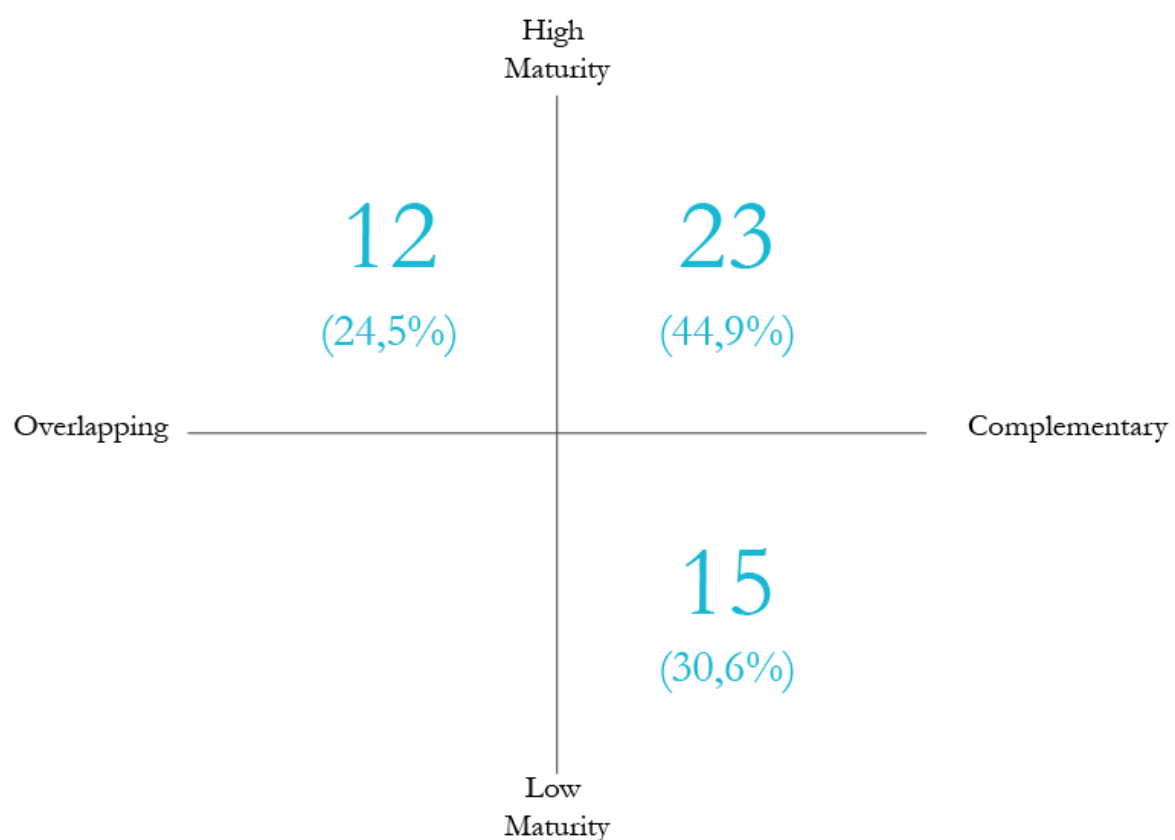


Figure 24: Cross 1. Maturity of the Relationship with Complementarity of Competencies

The numbers indicated in the graph show the aggregate number of couples that belong to each quadrant.

The resulting chart shows that, according to the couples of our database, the relationships characterized by a High Level of Maturity show up in both the two types of competencies (complementary and overlapping), it also shows that the majority of the couple belongs to the category of complementary competencies (23 couples out of 38). Conversely, all the couples characterized by Low Maturity of the Relationship are positioned in the complementary competencies quadrant, leaving the overlapping quadrant completely empty.

We will now analyze each of the three quadrant starting from an analysis of the High/Low Maturity quadrants to then distribute the couples also following the Complementary/Overlapping quadrants.

### High Maturity of the Relationship quadrants

35 out of the total 50 couples are included in the High Maturity of the Relationship variable. As mentioned above, we did expect this kind of distribution, as two partners that have a long and trustworthy relationship between them before deciding to develop a project together usually get higher performances in terms of reaching the desired outcomes.

Evidences of what we just argued can be found in the literature, in fact, as Klinga et al., (2016) said: “A creation of trustful and loyal relationship is indispensable, as the confidence that emerges from trust and loyalty provides a space for mistakes to be made without jeopardizing the relationship”.

Also Gu et al, (2016) stated that the connection and the deep knowledge of each other is very important in a relationship, in fact they said that: “the trusting relationship makes [the members of a team] feel comfortable to share their idea without being afraid of being rejected or embarrassed, thereby providing the exchange of knowledge between one another”. Also the very fact that the database shows a net majority of couples characterized by a High Maturity of the Relationship confirms that trust and confidence play an important role in the

couple's creation.

We will now analyze how the couples of the database are divided according also to the Overlapping/Complementary variable (Variable 1).

### 1. High Maturity of the Relationship quadrants: Complementary competencies

This is the quadrant with the highest number of couples: in fact the couples that belong to this quadrant represent the 44,9% of the entire database, almost half of the entire database.

The fact that the majority of the couples belongs to this quadrant teaches an important lesson: in order to be successful and to reach a common goal, the two individuals that form a couple usually need a long time in order to adapt to each other, to gear and to succeed. Even successful couples certainly at the dawn of their relationship had some misunderstandings and difficulties because the two innovators usually come from different worlds and speak an incomprehensible language to the other. However, the foresight and the desire to work together pay them back by allowing the two individuals to function in the long run and to be the reference point for the other in every kind of situation.

### 2. High Maturity of the Relationship quadrants: Overlapping competencies

Having a look to the second quadrant concerning High Maturity, we can notice that only 12 out of 35 couples belong to this cluster. Investigating more deeply into the stories of these couples, we notice that what they have in common is the fact to be formed by members who share the competences. This happens because the members of the couples usually studied together in the university or are employees of the same company, which are therefore trained according to the same culture, the same values and the same skills.

The fact that only 12 of the couples present in the database fall under this categorization can easily be explained thinking about the original aim of the database itself, which is to construct an exhibition that would investigate the



genius on one side and the entrepreneur on the other. A genius and an entrepreneur must necessarily have different skills, hence the relatively small number of couples belonging to this cluster.

### Low Maturity of the Relationship quadrant

The relationships characterized by a Low Level of Maturity show a net distribution in terms of Complementarity of Competencies: in fact all the couples of the database characterized by a Low Level of Maturity show a set of skills that are complementary between the two members.

In order to understand more in deep what are the couples which fall under this quadrant, we want to offer an overview of the Entity type of the couples which belong to the Low Maturity of the Relationship cluster. They are distributed as it follows:

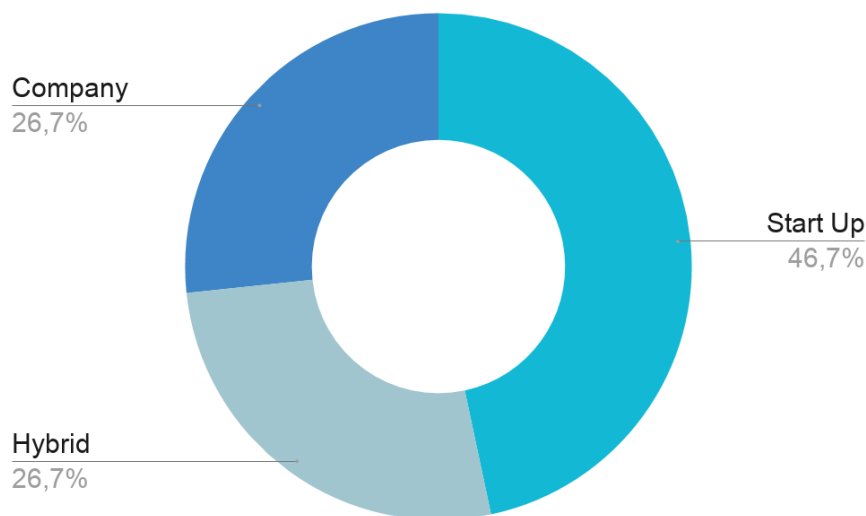


Figure 25: Representation of the Entity Type of the couples belonging to the Low Maturity of the Relationship cluster

We can easily observe that the majority of the couples inside the cluster belongs to the Startup and Hybrid category, while there are only 4 couples which pertain to the Company entity. This fact explains that Low Maturity of the Relationship

and Complementary Competencies are the right characteristics to look for in a couple who wants to start a brand new activity: in fact those are characteristics that in couples belonging to consolidated companies almost do not appear.

We assume that the couples characterized by a complementary set of skills are the ones that follow the simple path of the Complementarity of Competencies, since that the members of these couples search in each other those competencies that the individual alone does not have. We can say that this relationship is based on a common sense of missing shared between the two individuals, who decide to work together because they feel that the other person can complete them, it is a functional-based relationship. So, the reason why the two members of the couple can easily work together is because one member finds in the other skills and capabilities that are complementary to his/her. We imagine that the relationship of those couples can be described as a meeting in the right moment and in the right place: it is like if the two members of the couple were looking for the same thing and found in the other person the missing piece of puzzle they needed in order to carry out their initial goal, like a “love at first sight” kind of relationship. We expected this kind of situation, in fact Low Maturity of the Relationships usually lack the trust that we have argued about: so, it is reasonable to think that the most important driving factor for the two individuals to work together is to find in the other person complementary missing skills necessary for reaching the common objective.

Even if it is not possible to predict where the two members of a future couple will meet, in his book “Powers of two” Shenk argues about some so-called “magnetic places” where people who are in search of a working partner involuntarily attend: it is precisely in these places that the members of a future couple often meet, unleashing in them that feeling of “love at first sight”.

Looking at the cluster from another perspective and analyzing the distribution in time of the 15 couples that belong to the quadrant, we find that time is not a

variable that can help in analyzing the phenomenon: in fact the couples that pertain in this cluster are randomly distributed from 1957 to 2018.

In order to give a complete view of the Low Maturity/Complementary skills cluster, we finally analyze if there is a pattern related to the age of the members of the couple. What we want to verify is if this kind of “love at first sight” relationship happens between people of the same age or if it happens more easily when two individuals belong to different generations (meaning different backgrounds and skills that would make them even more complimentary). We want to proceed systematically, thus analyzing one by one the different couples of the database and assigning to them the characteristic of “Same generation” if the two members of the couple have less than 8 years of difference in age and “Different generation” if the two members of the couple have more than 8 years of difference in age. The entire process of systematic classification can be appreciated in the database reported in the Appendix.

Either analyzing the cluster under the generational point of view, we cannot find any particular correlation between the phenomenon and the age variable, as the couples seem to be equally distributed in terms of same and different generation.

In conclusion, we want to spend a few words on the only quadrant in which no couples are allocated. Indeed, the fact that no couple belongs to the Low Maturity of the Relationship/Overlapping cluster gives us the possibility to say that it is probably very hard, almost impossible, for people who have the same skills and competencies, to undertake a project together without previously going in deep with their relationship and arriving at a good level of trust and confidence.

Given that the first variable gave us some important insights about the description of the patterns that link the couples in the database, we now want to turn our focus to an additional cross, namely Maturity of the Relationship and Entity type.

### 6.4 Cross 2. Entity type – Maturity of the Relationship

We will now provide a second cross of variables in order to understand if there is a correlation between them and so if it is possible to state that High or Low Maturity of the Relationship encourage or disadvantage the establishment of a Startup, a Hybrid or a Company type of collaboration.

The resulting chart shows how the couples inside the database distribute according to the two chosen variables. Also in this graph, the numbers represented indicate the number of entities that fall under each specific cluster.

High Maturity	26 (51%)	7 (14,3%)	2 (4,1%)
Low Maturity	4 (8,2%)	7 (14,3%)	4 (8,2%)
	Company	Startup	Hybrid

Figure 26: Cross 2. Maturity of the Relationship with Entity Type

As we can see from the graph there is a substantial polarity in the High Maturity/Company cluster, so it possible to say that the two variables influence

each other: so we will now zoom inside the graph to go in deep with each cluster. In order to have a better vision of the chart, we think it is opportune to proceed by looking at one category at a time, to figure out if there are specific characteristics that better explain the distribution of the 50 couples inside the chart.

### Company Entity

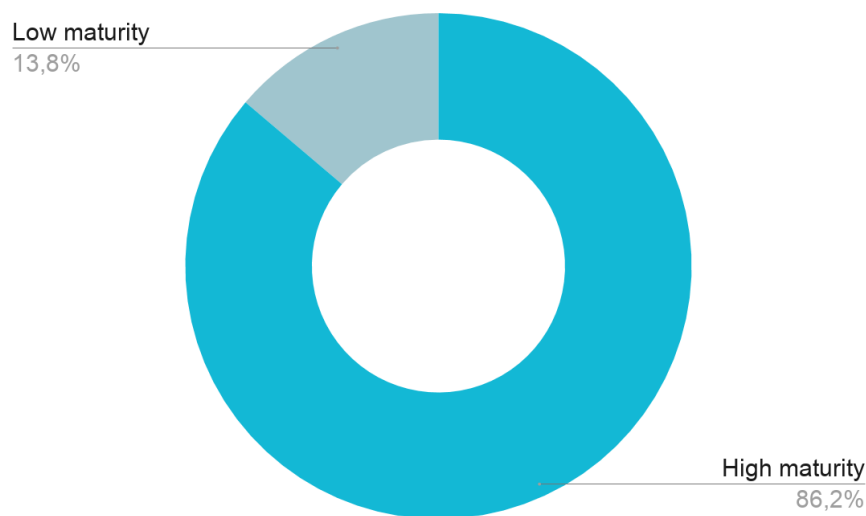


Figure 27: Representation of the Maturity of the Relationship variable within the framework of the Company Entity Type

As we can notice from the pie chart, the couples which fall under the entity type “Company” are divided between High Maturity of the Relationship and Low Maturity of the Relationship, with an overwhelming majority of couples formed in a Company which pertains to High Maturity. The total of 30 couples is in fact divided between 26 High Maturity (86,2%), and 4 Low Maturity (13,8%).

Our interpretation of those percentages is that in the case of couples formed in a Company, innovation comes from individuals who have known each other from a long time, while it is rare that innovation stems from two individuals that

did not know before, and in fact only 4 couples out of 30 belong to the Low Maturity of the Relationship category.

We expected this kind of situation because people inside a company tend to work together in team and are used to co-work: it is therefore more likely that the two individuals know each other from a reasonably long period before deciding to develop an innovation together. According to our previous discussion, it can be difficult to understand what is the kind of couple that belongs to the category of Low Maturity of the Relationship in a Company. So, in order to better understand this kind of couples we will provide an example taken from our database about one couple belonging to this group: the case of the XY Polymer invented by the company Alpha-Mu. The investigation on the Polymer XY was conducted by Michael McGlynn and Geraldo Udinesi: McGlynn was working in Alpha-Mu since 1984 and in the early 2000s was one of the most important personalities in the lithium-ion battery market, given his ten years experience in the field. In 2008 he met Udinesi, who at the time was conducting researches and trying to develop a new technology for a revolutionary material to be used inside lithium batteries. McGlynn immediately understood the potential of the innovation made by Udinesi, and firmly believed in its use in the lithium batteries. Together they decided to take the risk and decided to promote and support the research and its technical development.

Given this example, it is clear that inside the cluster Low Maturity of the Relationship applied to the entity Company we find the couples in which the entrepreneurial personality decides to give voice to one of his/her employees (in most of the cases scientists) driven by a strong belief in the innovative idea. Following the trend of the aforementioned “magnetic places” discussed in the paragraph related to the High Maturity level relationships, we can now state that companies can become themselves magnetic places where innovation emerges. So, even if it is much more frequent that the process of innovation starts between people who have known each other for a lot of time, we cannot exclude that it

can sparkle even if the two people have just met, even if statistically is much more difficult to happen.

### Startup Entity

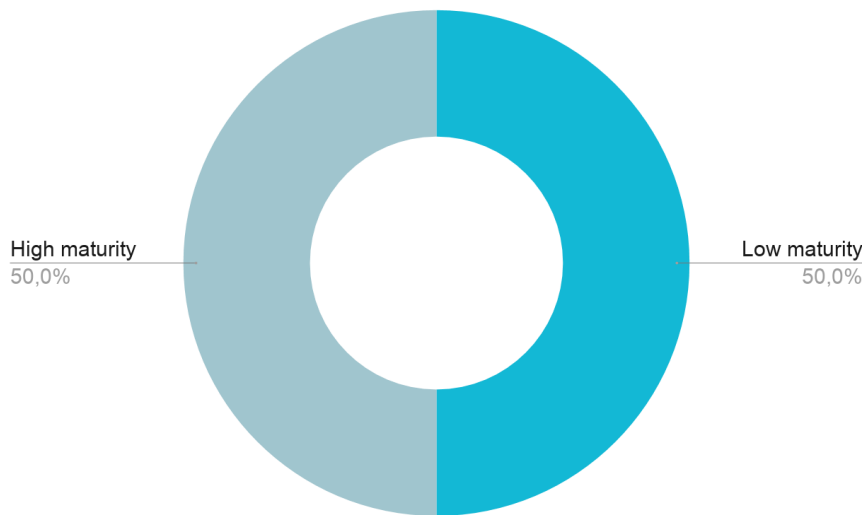


Figure 28: Representation of the Maturity of the Relationship variable within the framework of the Startup Entity Type

As it is possible to notice from the pie chart, the Startup entity seems to show no relevant distribution along to the Maturity of the Relationship variable: in fact there are 7 Low Maturity Startups and 7 High Maturity Startups. The couples belonging to the Low Maturity of the Relationship cluster can be easily explained thinking about the intrinsic nature of a Startup: in fact a Startup needs a lot of resources both in financial terms and human resources terms. For this reason, we believe that usually innovators find comfortable in creating a new Startup together with someone they “need” (someone who has complementary skills) more than with someone they just “know”, which can be for example a trustworthy friend. So, in the Low Maturity of the Relationship cluster there are those couples which decide to build up a Startup combining their competencies

and their skills on the base of a common sense of missing, a common desire for change. Even if they do not know each other for a long time they immediately felt deeply connected and understood from the other.

What we have just stated of course does not imply that it is not possible to create a Startup together with someone known: in the cluster High Maturity of the Relationship cluster in fact we can find couples composed by relatives, university mates, or individuals who used to work together. All of these couples present a high level of trust inside, the members perfectly know each other, and it is thanks to this trust that they decided to form a Startup together.

### Hybrid Entity

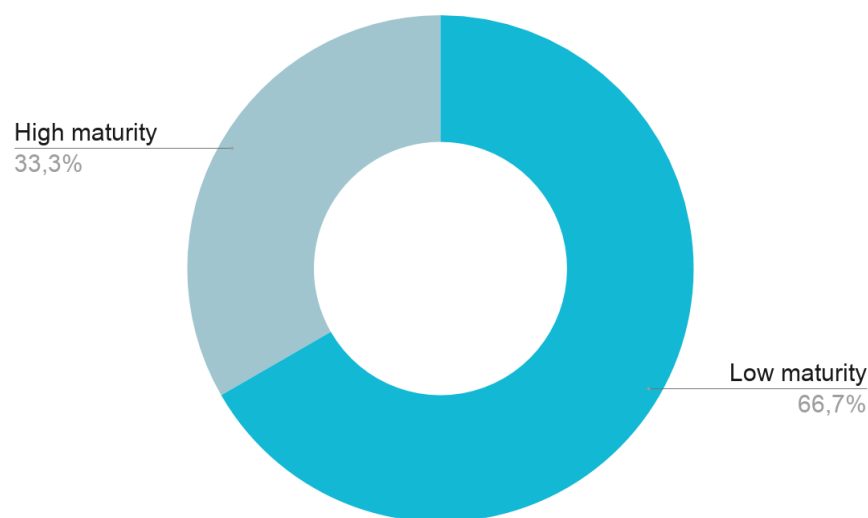


Figure 29: Representation of the Maturity of the Relationship variable within the framework of the Hybrid Entity Type

Out of the three cases analyzed, this is the only Entity type in which the Low Maturity of the Relationship category has a higher number of observations: in fact 4 couples (66,7% of the total) belongs to the Low Maturity of the Relationship category, while only 2 couples belong to the High Maturity of the



Relationship category. Given the fact that a Hybrid kind of collaboration establishes when a Company calls an individual specifically because of his/her competencies, it is clearly not important if the two parties knew each other previously: what really matters is the sharing of competencies. Companies in this way can “borrow” brilliant minds and skills in order to accomplish objectives that they would not be able to accomplish alone.

Looking at the cross between the Maturity of the Relationship and the Entity type variables, we can argue that there is not a clear and unique result when the two variables match, the results in fact vary a lot for each cluster resulting from the crossing itself.

In conclusion, we can say that on one side, when an innovation develops **inside** the boundaries of a company, the tendency that we have observed is that the members of the couple know and trust each other and have a high level of trust and a deeper level of confidence between them. Conversely, when an innovation develops **outside** the boundaries of a company, two main possibilities arise: to build up a Startup or to be contacted by the Company for a Hybrid kind of collaboration.

In the Startup case, no significant correlation has been found, meaning that the Startup Entity type behaves randomly about the Maturity of the Relationship variable. Hybrids represent those special cases that act differently: in fact it looks like that this type of collaboration establishes more easily (or at least it happens more frequently), in case of a relationship characterized by a Low Maturity of the Relationship level.

### 6.5 Discussion of the Results

The first main finding is mostly related to the characteristics of the couples that are directly observable from the variable Maturity of the Relationship: since a High Maturity of the Relationship level characterized the majority of the couples (as it is possible to notice from Figure 15), we can argue that developing an innovation, in most of the cases, takes its time. This is due to the fact that trust and confidence between the two members of a couple are fundamental factors for the instauration of a work environment that makes the two individuals feel safe and comfortable to open up to new ideas and to co-lead. It is not easy to invest in this kind of dual relationship and it is not easy to foresee if the relationship will lead to a result for which it worthy to invest time, still we can argue that, in terms of innovation, having a deep knowledge of the other member of the couple always pays back. Even if we discussed about cases in which individuals who did not know each other managed to innovate together, we still believe that a deep knowledge of the co-worker is always the best way to proceed, as also indicated by many authors in the literature.

The second finding is related to the variable Complementarity of Competencies: we found that the only way in order to make the members of the couples characterized by a Low Maturity of the Relationship innovate is that they have complementary skills. In fact this is the case in which the two individuals do not know each other: still if they have complementary skills they can at least rely on the fact that they can “complete” each other under a practical point of view, so in this way they feel they can work together and innovate. The Complementarity of Competencies path seems to be an “easy path” in order to find a solution to that common sense of missing shared by the two individuals. From this perspective, we can say that working in pairs is a good way to make the most out of someone thanks to the acquisition of skills and competencies that are missing in one of the two actors. It can maybe sound opportunistic to someone, but the mechanism is reciprocal and if the two individuals have a

common goal and a focused vision, those kinds of relationships work very well, as we clearly understood during our exploration and research on the database.

The third finding is related to a more practical and organizational aspect. We discussed about Companies, Startup and Hybrid as the three main Entity types connected to the spread of an innovation. We observed that individuals that have a superficial knowledge of each other mostly develop innovation using as organizations Startups and Hybrids, which are generally characterized by faster and riskier development. Conversely, when it comes to an innovation developed inside the boundaries of a Company, we observe that it is mostly undertaken by couples characterized by a high level of trust and confidence. Also, in companies generally the process of innovation requires long researches and tests before a practical implementation, allowing the individuals to better know each other.

In conclusion, we can say that the variables that we identified as most relevant for shared and dual leadership and that we decided to analyze for pairs in order to explore the link between couples and innovation, definitely have an impact on the processes, the nature and the type of innovation. We feel that with our research we strengthened the theory about the connection between duos and innovation, giving some important points of reflection and insights about the topic.

# 7 Conclusion

## 7.1 Introduction to the chapter

The last chapter of our thesis is about conclusions and it is structured as it follows:

- Paragraph 7.2 draws the conclusions of our empiric research and findings related to the Research Agenda depicted at the end of Chapter 2.
- Paragraph 7.3, illustrates the contributions given with our research and suggests some guidelines for practitioners and literature that open up to unsolved questions to further investigate.
- Paragraph 7.4 illustrates the limitations of our research, which are mostly related to the restricted geographical area in which our research has been conducted.
- Paragraph 7.5 uses the limitations described in paragraph 7.4 as triggers for future researches in the field of dual leadership and innovation.

## 7.2 Findings

In the Research Agenda depicted in paragraph 2.9, we highlighted some points that the literature about shared leadership still has to investigate and clarify. We were not able with our thesis to deal with them all, but we feel that we have given our contribution to the drawing of a general overview of shared and dual leadership. In the two theoretical frameworks related to the two leadership styles, we summarized and connected between them antecedents, moderators and outcomes in order to put together inside a unique framework that gathers the evidence given by the literature. We did this because we found that the literature concerning shared leadership and dual leadership is rather fragmented and that

generally each article focuses deeply on one or maximum two antecedents/moderators at the time, thus losing the big picture and the magnitude of the investigated topic.

In the second part of the thesis, we focused on the dynamics that emerge in the process of innovating in two, by paying particular attention to the whole process besides the specific variables that play a role during the process. With our research, we described and analyzed the link between shared leadership, in particular dual leadership, and innovation, not only pointing out a list of moderators, but also discussing the steps, the characteristics and the dynamics through which shared leadership operates, giving important evidence about the reasons why it works and its mechanism. We in fact showed how couples are formed, from where did they start and how they divide the work between the two members, highlighting characteristics specific of their behavior in different cases. Given that team characteristics, couples characteristics in our specific case, and composition are important antecedents of shared leadership (Conger & Pearce, 2003), we then identified different clusters according to the type of relations that exists between the members of the duos and so the different shades of their approach to innovation.

## 7.3 Contributions

### 7.3.1 Contributions to the literature

After having illustrated the findings of our empirical analysis, we are finally ready to assess whether our study has been useful in order to fulfill the points presented at the end of Chapter 2. The first point was related to the enrichment of the strand of literature that links dual leadership to innovation to partially bridge the research gap on the link between dual leadership and innovation. The main reference study for fulfilling this point is the one provided by Hunter et al., (2017) in which they challenged the traditional unity of command models of leadership

and proposed that a dual-leadership framework can serve as a potential solution to the challenges of innovation. We can say that this first point has been successfully fulfilled, as with our study we gave a substantial contribution to enriching the strand of literature that links dual leadership to innovation.

The second point was related to investigating whether in our sample of innovative couples Complementarity of Competencies and Maturity of the Relationship can be considered as moderators of the link between dual leadership and innovation. The point was aimed to deepen the researches of Fausing et al., (2015) and Muethel and Hoegl, (2016) in which that deepened respectively the concepts of complementarity and of the respect of the competencies inside the team and of Wu et al., (2018) and Nicolaides et al., (2014), which wrote about the concepts of team maturity and team tenure. We feel that also the second point has been successfully fulfilled, as we identified that Complementarity of Competencies and Maturity of the Relationship actually have an impact on the relationship between dual leadership and innovation, leading us to say that the two observed variables can act as moderators in the dual leadership theoretical framework.

The third point was related to understanding the dynamics which establish among the members of a couple who decide to undertake a business project together. This point is radically linked to the observations made on the couples database of pairs and therefore finds references in the specific literature on couples such as the articles by Klinga et al., (2016) and Gu et al., (2016). Specifically, we wanted to understand what is the reason that leads a couple to form and to maintain over time and what are the effects of working in pairs on the outcomes. We feel that we have contributed to the understanding of the dynamics which establish among the members of a couple who decide to undertake a business project together expanding and deepening the existing literature: we have in fact identified that time, trust, confidence and Complementarity of Competencies are the main reasons that lead couples to

form and to maintain over time.

Since our research was mostly a descriptive analysis of dynamics and behaviors of couples that approach innovation, our general contribute to the Research Agenda of shared leadership has been the fulfillment of the three main points that we have just finished to illustrate. We in fact contributed to give a comprehensive and detailed overview of shared leadership and dual leadership discussing how they emerge and develop over time. In the second empiric part of the thesis, as already mentioned, our research focused on pairs trying to summarize the most important aspects that lead individuals to form couples and to innovate together. This descriptive analysis has brought us into a very empirical dimension, which however also contributes to the Research Agenda, expanding it with the first study on dual leadership as a variant of shared leadership. Our work, in fact, opens up to new opportunities in terms of future researches by highlighting the incredible power and vision of pairs when it comes to innovation.

### 7.3.2 Contributions to practitioners

We think that our research can be also beneficial for those managers and entrepreneurs who are looking for new ways to innovate in their organizations. Having understood that working in pairs is highly performing when it comes to innovation, to them we suggest to:

- Establish a work environment that favors the formation and in-depth knowledge of solid duos. What is important is that individuals feel safe and comfortable in opening up with others and in discussing new ideas and projects during work time.
- Accept that innovation could require time to develop: even if we mentioned couples that were characterized by a Low Maturity of the Relationship where innovation seems to develop quickly, in

most of the cases the process is long and not always easy, because the collaboration, in order to succeed, needs a solid and trustful relationship.

- Give the possibility to employees coming from different units to spend time together: complementarity of the skills, different points of view and different ways of processing information are the keys to success.

For what concerns innovators with a great idea who are looking for the perfect partner to work with, we suggest to:

- Spend time in new places, look for new situations, discuss the idea with people with different backgrounds and open up to new visions and ideas. Get out of the comfort zone and known places and look for someone who could have complementary skills. Speaking up with other people can also be the perfect way to test the innovative idea and to improve it.
- At the same time, do not forget about friends, family and colleagues: argue with them about the feeling of missing something, about the innovative idea and the feelings towards it. Going in deep with trusted and estimated people is also an excellent way to collect insights about an idea.

## 7.4 Limitations

Before offering cues for future researches, we have to enunciate several limitations and points of caution that characterize our study.

A first important limitation is related to the empiric part of the thesis: the database of couples provided by the Politecnico di Milano was not in fact devoid of constraints. The main constraint is represented by the geographical area in which the couples operate: the database was in fact originally developed in order



to describe couples that operate specifically in the Lombardy region, not leaving space for pairs of innovators operating in other regions of Italy. As we mentioned before, Milano and Lombardy is the area of Italy in which the major part of the investments in innovation are concentrated: still, we cannot avoid mentioning that in our research we did not consider at all couples coming from other Italian regions which as well invest in innovation, such as Lazio, Emilia Romagna, Piemonte and Veneto. For this reason, we can say that the results of our research is therefore limited to a specific geographical context: a sample made purely of couples of the Lombardy Region may not represent an optimal sample for the empirical research that has been conducted in this thesis.

A second important limitation regarding our sample is related to the culture of its members: in fact, since the sample used for empirical research on couples is geographically localized, we assume that the components of the sample are culturally very similar and therefore equally prone to accept a shared leadership model. However, our study may not be valid for those cultures far from ours. In this regard, we mentioned in the section concerning the antecedents of shared leadership the study by Muethel and Hoegl, (2010) in which are illustrated the potential impacts of power distance on shared leadership. We stated that power distance represents the extent to which the members of institutions and institutions accept and expect that power is distributed unequally and that it is measured with the Power Distance Index: the lower index, the less powerful members of the organization accept the unequal distribution of power. We can assume that our empirical study is valid for those countries that have a western culture and that have a relatively low power distance index such as Italy (power distance index equal to 50), USA (40), Germany (35 ) or Australia (36), while it is unlikely to be equally valid where the power distance index is much higher as for instance in China (80) in the Philippines (94) or in Malaysia (104). A third limitation, of theoretical domain, is given by the fact that, as mentioned in the Research Agenda by Zhu et al., (2018) but also by Carson et al., (2007),

there is no precise definition of shared leadership in the literature nor even a measurement universally accepted thereof. These are therefore in our opinion interesting cues for a more complete understanding of the topic at a theoretical level. Future work should focus on a detailed understanding of the nature of shared leadership, its development, and boundary conditions on its effectiveness (Carson et al., 2007).

One last limitation can be found in the way the original database was formed, namely through an open call. The mechanism of the open call is very useful to get in touch with many possible candidates, but it can be limiting: in fact, using this mechanism, all the potentially interested couples which do not know about the open call are left behind.

All the limitations that we discussed are potential triggers for the future researches that we are going to illustrate in the next paragraph.

### 7.5 Future Researches

We believe that the framework we have created can contribute substantially to understanding and theorizing the connection between dual leadership and innovation, a subject which, as we understood during the development of our research, has not been studied much in the literature to date. Besides this, we also believe that the exploration of the connection between dual leadership and innovation appears worthy of future research efforts, having found interesting patterns that can be deepened.

The main suggestion we want to give to those who want to deepen our research is to create a less geographically localized database of pairs from which to start the analysis. In fact, through a broader observation base, it will be possible to comprehend couples from different Italian regions and to analyze the trend of innovating in two not limiting the research to one specific geographical area. Therefore we suggest expanding the couples database by involving not only pairs

from the Lombardy region but throughout Italy, in order to confirm or reverse the tendency of innovators to work in pairs throughout the entire national territory.

Another important field for future research related to dual leadership, as suggested by Hunter et al., (2017) is to consider how a dual leadership approach would apply to contexts that lie outside innovation. In fact we can state that dual leadership can be effective in contexts (such as the innovation's one) which are characterized by nonlinear and complex variables, but other contexts may benefit from other types of leadership styles.

The third area of research that could be investigated starting from our study is rooted in the fact that in this thesis we have limited our considerations in the way in which couples form, without further investigating the ways in which the relationship between the two individuals change over time. For this reason, a further fertile area of research on dual leadership is the over-time change in the relationship between the two members of the couple.

In conclusion, shared leadership is a constantly evolving phenomenon, difficult to interpret since the research in this field is still backward and in progress. Numerous questions remain still unanswered, however, we believe that with our thesis we provided a big contribution for the understanding of the impact of shared leadership and dual leadership on innovation and team performances. We think that shared leadership is an interesting topic worthy of further investigation: even if some dynamics that lie behind shared leadership still remain unclear, as we have seen in our thesis, they are undoubtedly functional when it comes to innovation. The most important lesson taken from our research is that innovation requires time and experience, not excluding, however, that it can be a process that happens quickly when the perfect partner is found.

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## Appendix

Name of the company	Gender	Area	Name 1	Name 2	Co-Founders	Profession	Reference Market	Product or Service	Variable 1	Variable 2	Variable 3	Generation	Type of innovation
Alpha	Male Female	Healthcare	Margherita Nucci	Filippo Longo	Yes	Nucci is CEO - Longo is CTO	B2B	Service	Complementary	High Maturity	Company	Same	Technology push
Beta	Male Male	Digital	Ivan Li Fonti	Lodovico Cattaneo	Yes	Both of them are CEO	B2B	Service	Complementary	High Maturity	Company	Same	Technology push
Gamma	Male Male	Sport	Lino Loggia	Mario Pugliesi	Yes	Both of them are CEO	B2C	Service	Complementary	Low Maturity	Startup	Different	Design push
Delta	Male Male	Digital	Carmin Gallo	Colombano Padovesi	Yes	Both of them are CEO	B2B	Product	Complementary	Low Maturity	Hybrid	Different	Design push
Epsilon	Female Female	Healthcare	Elisabetta Panicucci	Mariaelena Pisano	Yes	Panicucci CTO - Pisano CFO	B2B	Product	Overlapping	High Maturity	Company	Same	Technology push
Zeta	Male Male	Robotic	Nestore Milanesi	Alberto Bucchi	No	Milanesi is General Director - Bucchi is an Engineer	B2C	Product	Complementary	High Maturity	Hybrid	Different	Technology push
Eta	Male Female	Engineering	Osvaldo Capon	Eliana Toscani	No	Capon is PM - Toscani is CEO	B2B	Product	Complementary	High Maturity	Company	Different	Technology push
Theta	Male Female	Pharma	Adolfo Fanucci	Benedetta Sabbatini	Yes	Fanucci is President - Sabbatini is HR manager	B2B	Product	Complementary	High Maturity	Company	Same	Technology push

Iota	Male Male	Digital	Arduino Pisano	Alfonso Onio	Yes	Pisano is CEO - Onio is COO	B2B	Service	Overlapping	High Maturity	Startup	Same	Market pull
Kappa	Male Male	Interior Design	Isaia De Rosa	Antonino Marcelo	No	Marcelo is an Architect - De Rosa is the founder and Director	B2C	Product	Complementary	Low Maturity	Company	Different	Design push
Kappa	Male Male	Interior Design	Isaia De Rosa	Isidoro Li Fonti	No	De Rosa is The founder and Director - Li Fonti is a designer	B2C	Product	Complementary	Low Maturity	Company	Different	Design push
Lambda	Male Male	Food	Franco Bellucci	Geronimo Padovano	Yes	Bellucci is CMO - Padovano is CEO	B2C	Service	Complementary	High Maturity	Startup	Same	Design push
Mu	Male Male	Energy	Adalrico Napoletano	Severino Lombardo	No	Napoletano is CTO - Lombardo is CEO	B2B	Service	Complementary	High Maturity	Company	Same	Technology push
Ni	Male Male	Travel	Leonardo Fallaci	Oliviero Milanesi	Yes	Fallaci is founder - Milanesi is senior event manager	B2B	Service	Complementary	High Maturity	Startup	Different	Design push
Chsi	Female Female	Digital	Ginevra Toscani	Isabella Marchesini	Yes	Both of them are CEO	B2B	Service	Complementary	High Maturity	Company	Same	Market pull
Omicron	Male Male	Healthcare	Valente Fiorentini	Quintiliano Mareschi	No	Fiorentini is owner - Mareschi is Business Developm net Manager	B2C	Service	Complementary	High Maturity	Company	Different	Technology push



Pi	Male Male	Engineering	Nunzio Bellucci	Fabiano Siciliano	No	Bellucci is founder - Siciliano is Director of Production	B2B	Product	Complementary	High Maturity	Company	Same	Technology push
Rho	Male Female	Communic ation	Oscar Greco	Fernanda Palermo	No	Palermo is CEO - Greco is Marketing and Innovation Manager	B2B	Service	Complementary	High Maturity	Company	Different	Technology push
Sigma	Male Male	Digital	Lamberto Visconti	Mariano Picci	No	Visconti is CEO - Picci is the founder	B2B	Service	Complementary	High Maturity	Company	Same	Design push
Thau	Male Female	Healthcare	Virginia Morelli	Vincenzo Morelli	No	Vincenzo Morelli is the owner - Virginia Morelli is a Psychologist	B2C	Product	Overlapping	High Maturity	Company	Different	Technology push
Upsilon	Male Female	Healthcare	Raul Massa	Simona Manna	Yes	Massa is Co founder - Manna is a member of the board	B2B	Product	Complementary	Low Maturity	Startup	Same	Technology push
Phi	Female Female	Digital	Agostina Padovan	Caterina Trevisano	Yes	Padovan is CEO - Trevisano is CCM, Chief Content Manager	B2B	Service	Overlapping	High Maturity	Company	Same	Market pull
Chi	Male Male	Fashion	Enrico Tesio	Leonardo De Castro	Yes	Tesio is CEO - De Castro is Co founder	B2C	Service	Overlapping	High Maturity	Company	Same	Design push

Psi	Male Male	Communication	Riccardo Leni	Leonardo Isella	Yes	Leni is CEO - Isella is Co founder	B2C	Service	Overlapping	High Maturity	Startup	Same	Market pull
Omega	Male Female	Design	Roberto Galli	Liliana Canditi	Yes	Galli is Founder and Creative Director - Canditi is Founder and CEO	B2C	Service	Complementary	Low Maturity	Company	Different	Market pull
Alfa-Alfa	Male Female	Sport	Jacopo Columbu	Valeria Vannelli	Yes	Columbu is CEO - Vannelli COO	B2C	Service	Complementary	High Maturity	Startup	Same	Market pull
Alfa-Beta	Male Male	Digital	Gioele Minicucci	Carminé Iarossi	Yes	Minicucci is CEO - Iarossi is CTO	B2B	Service	Overlapping	High Maturity	Company	Same	Technology push
Alfa-Gamma	Male Male	Digital	Daniele Ospite	Giulio De Felice	Yes	Ospite is CEO - De Felice is CTO	B2B	Service	Complementary	Low Maturity	Startup	Same	Market pull
Alfa-Delta	Male Male	Engineering	Gianluca Giorgini	Francesco Dalla Rena	No	Giorgini is CEO and founder - Dalla Rena is a Professor and Scientific Advisor	B2B	Product	Complementary	Low Maturity	Company	Different	Design push
Alfa-Epsilon	Female Female	Fashion	Carolina Bruno	Laura Bellucci	Yes	Both of them are CEO	B2C	Product	Overlapping	High Maturity	Startup	Same	Design push
Alfa-Zeta	Male Male	Aerospace	Lucas Del Torchio	Gaetano Paterniti	Yes	Del Torchio is CEO - Paterniti is CTO	B2B	Service	Overlapping	High Maturity	Company	Same	Market pull

Alfa-Eta	Male Male	Engineering	Jody Anfossi	Daniele Mapelli	Yes	Anfossi is CEO - Mapelli is Administrator	B2C	Product	Complementary	Low Maturity	Startup	Same	Design push
Alfa-Theta	Male Male	Healthcare	Gregorio Trevisani	Gustavo Manna	Yes	Trevisani is Operation Manager - Manna is CEO	B2C	Service	Complementary	High Maturity	Startup	Different	Market pull
Alfa-Iota	Male Male	Environment	Pasquale Pinto	Vittorio Genovesi	Yes	Pinto is Founder and CEO - Genovesi is Co founder	B2B	Service	Complementary	Low Maturity	Hybrid	Same	Market pull
Alfa-Kappa	Male Male	Engineering	Ivan Monaldo	Rolando Romani	No	Monaldo is CEO, Romani is R&D manager	B2B	Product	Complementary	High Maturity	Company	Same	Technology push
Alfa-Lambda	Male Male	Engineering	Giorgio Nani	Lisandro Siciliano	Yes	Both of them are Managing Directors	B2B	Service	Complementary	Low Maturity	Startup	Different	Technology push
Alfa-Mu	Male Male	Engineering	Michael McGlynn	Geraldo Udinesi	No	McGlynn is Senior Scientist - Udinesi is Marketing Strategy Expert	B2B	Product	Complementary	Low Maturity	Company	Different	Technology push
Alfa-Ni	Male Male	Engineering	Abramo Calabresi	Giuseppe Calabresi	No	Both of them were Engineers	B2B	Service	Complementary	High Maturity	Company	Different	Technology push
Alfa-Chsi	Male Male	Digital	Cesare Zito	Andrew Funk	Yes	Zito is President - Funk is Chief Talent Officer	B2C	Service	Complementary	High Maturity	Company	Same	Market pull

Alfa-Omicron	Male Male	Food	Ortensio Marchesi	Alessio Lucchese	No	Marchesi is a Professor - Lucchese is the President of Alfa-Omicron	B2C	Service	Complementary	Low Maturity	Hybrid	Same	Technology push
Alfa-Pi	Male Male	Engineering	Tranquillo Romani	Mauro Testori	No	Both of them were Engineers	B2C	Product	Overlapping	High Maturity	Company	Same	Technology push
Alfa-Rho	Male Male	Engineering	Giacomo Bilotta	Eugenio Bilotta	No	Giacomo is CEO - Eugenio is Business Development Director	B2B	Service	Complementary	High Maturity	Company	Different	Design push
Alfa-Sigma	Male Male	Healthcare	Michele Invernizzi	Ettore Stella	Yes	Invernizzi is CEO - Stella is CTO	B2B	Product	Complementary	Low Maturity	Startup	Same	Design push
Alfa-Thau	Male Male	Engineering	Carlo Liuzzi	Matteo Ferraresi	No	Liuzzi is a Director of Production - Ferraresi is owner	B2C	Product	Overlapping	High Maturity	Company	Different	Market pull
Alfa-Upsilon	Male Male	Food	Manuele Vitello	Angelo Visconti	No	Vitello is General Director - Visconti is the owner	B2B	Service	Overlapping	High Maturity	Company	Different	Market pull
Alfa-Phi	Male Female	Healthcare	Lorenzo Cattaneo	Sara Piccio	No	Cattaneo is CEO and founder, Piccio is CEO	B2C	Product	Complementary	High Maturity	Company	Same	Market pull
Alfa-Chi	Male Male	Engineering	Ernesto Belcaro	Francesco Favarelli	No	Belcaro is a Researcher - Favarelli is the owner	B2B	Product	Complementary	Low Maturity	Hybrid	Different	Technology push

Alfa-Psi	Male Male	Tire	Natale Lorenzi	Maurizio Castoro	No	Lorenzi is General Manager Technolog y - Castoro is CEO	B2C	Product	Complementary	High Maturity	Company	Same	Market pull
Alfa- Omega	Male Male	Pharma	Michael Ferret	Valerio Longanesi	No	Longanesi was the owner - Ferret was a Researcher	B2B	Product	Complementary	High Maturity	Hybrid	Different	Technology push
Beta-Alfa	Male Male	Engineering	Leonardo Cantine	Vincenzo Casadei	No	Both of them are Scientific Advisors	B2B	Product	Complementary	High Maturity	Company	Different	Market pull