HUNGARIAN UNIVERSITY OF
AGRICULTURE AND LIFE SCIENCES

DOCTORAL (PhD) DISSERTATION

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HUNGARIAN UNIVERSITY OF AGRICULTURE
AND LIFE SCIENCES
KAPOSVÁR-CAMPUS

DOCTORAL SCHOOL OF MANAGEMENT AND ORGANIZATIONAL SCIENCE

2022

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Kaposvár Campus

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The Dark Side of Cross-Functional Teams: The Influence of Individual's Perception and Knowledge Hiding

DOI: 10.54598/002570

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KAPOSVÁR

2022

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ABSTRACT

In recent times, the challenges of business success require the use of cross-functional collaboration to solve social and business problems equally. However, in addition to these benefits, this interdisciplinary teamwork also poses dangers, such as knowledge hiding.

This dissertation investigates knowledge hiding in intra-team coopetition, considering the resulting factors affecting team effectiveness. A model was used that relates various influencing factors such as the individual's personality, perceptions within the organization, perceptions toward the team and the supervisor to the individual's behavior. The objective of this dissertation revolves around how the perception of the individual in cross-functional teams influences knowledge-hiding behavior. The model was empirically applied in three sub-studies with participants working in cross-functional teams. Seven hypotheses were formulated and statistically analyzed. The empirical results show that numerous factors influence individuals' knowledge-hiding behavior. Antagonistic self-perceptions and perceptions of a competitive supervisor led to the hiding of knowledge in the team by the individual. A perceived competitive climate in the team also leads to knowledge hiding, but competitive orientation in the individual itself does not. In this context, the correlation of trustworthiness to other team members is moderated. A supportive leader can influence knowledge hiding depending on the maturity level of the employees. The results fill the research gap, on the one hand, for individuals in cross-functional teams to self-reflect and manage from knowledge and, on the other hand, for supervisors and managers in designing business organizations, namely that supportive leadership is essential for successful cross-functional team behavior.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

CFI	-	Comparative Fit Index
CMB	-	Common Method Biased
COVID-19	-	Coronavirus disease 2019
CWB	-	Counterproductive Workplace Behaviors
IRC	-	Interpersonal Relationship Commitment
OCB	-	Organizational Citizenship Behavior
OCQ	-	Organizational Commitment Questionnaire
RQ	-	Research Question
RSMEA	-	Root Mean Squared Error of Approximation
SEM	-	Structural Equation Model
SRMR	-	Standardized Root Mean Square Residual
TLI	-	Tucker-Lewis Index
VIF	-	Variance Inflation Factor

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

In recent years, there have been major crises that have shaken the world. The COVID-19 pandemic was one of the largest crises in human history, with consequences that lasted for years (Ozili & Arun, 2020). With the pandemic, the economy was shut down and households were quarantined. Many businesses experienced organizational crises as they had to downsize or restructure to minimize costs and survive the pandemic (Malik, 2013, 2017; Ozili & Arun, 2020). This had corresponding consequences for employees. The unemployment rate rose moderately, and many employees had to go on short-time work or were laid off.

In addition to these uncertainties, the main negative social factors that developed were the disruption of cooperation among workers due to competition and knowledge hiding (König et al., 2020). Employees had to compete for shortened resources, take on more tasks, and often did not have the opportunity to complete them because they lacked the necessary information. Within this spiral, workers themselves were insecure, lost trust in work colleagues and leadership, and meanwhile withheld their knowledge to secure competitive advantage within the organization (Aarabi et al., 2013). Such an environment can distort perceptions between individuals, leading to negative consequences such as knowledge hiding.

Especially in times of uncertainty, studies have shown that team-based structures can provide security and stability in the workplace. Such teams and cooperative working are becoming increasingly essential to meet the needs of market (Galpin et al., 2007). In order to link departments within an organization for cooperative and achieve knowledge gains to increase productivity, the formation of cross-functional teams is necessary (Mohamed et al., 2004). A cross-functional team is a group of individuals from different departments with different knowledge (Ghobadi & D'Ambra, 2013) who share a common team goal and are expected to be more innovative, creative (Sethi et al., 2001) and successful (Ernst et al., 2010).

Knowledge sharing plays a significant role as the main reason for assembling cross-functional teams. By bringing together different experts from different departments, diverse knowledge accumulates, which helps to solve cross-thematic problems or to carry out projects successfully. Creating a knowledge transfer within the team, resolving resistance and thus clearing a path for the team is therefore a key factor for successful teamwork.

Nevertheless, behaving in cross-functional teams is a double-edged sword. In addition to the aforementioned benefits, disruption can also occur within these teams. Here, especially competition between team members plays an important role. Due to various reasons, such as job

insecurity (Ali et al., 2021; Butt & Ahmad, 2019; Feng & Wang, 2019), exclusion at the workplace (Riaz et al., 2019; Zhao et al., 2016) and time pressure (Qureshi & Evans, 2015; Škerlavaj et al., 2018) a competitive attitude can occur between team members, which inevitably leads to the hiding of knowledge.

Recently, two comprehensive reviews of knowledge management on knowledge hiding have been published, Anand et al. (2021) and Oliveira et al. (2021). Both emphasized the need for further research in the area of knowledge hiding under the characteristics of cross-functional teams. Anand et al. (2021) noted that knowledge hiding in particular is currently underrepresented under certain influences such as different hierarchies, generations, and cultures, while Oliveira et al. (2021) called for more work on the extent to which perceptions of trust or leadership influence knowledge hiding. The need for more research on knowledge hiding from these perspectives is therefore imperative given cross-functional teams and the uncertain times caused by the pandemic.

2 OBJECTIVES TO ACHIEVE

Advancing digitization also means rapid change in the work of cross-functional teams. Thanks to ever-improving technology, such as smartphones and mobile Internet, knowledge can be accessed anywhere and promotes team cooperation (Ton et al., 2022a). This possibility makes it feasible to request explicit knowledge without obstacles at any time. Internal knowledge, which is only accessible within the company, on the other hand, remains a commodity that cannot be retrieved so easily. It is action-bound and only emerges with the experience of the team members. Under these conditions, the dissertation investigates the circumstances and possibilities of how cross-functional teams can be built to overcome the obstacles of provision of internal knowledge. Among other things, the dissertation aims to identify perceptions of the individual in cross-functional teams that lead to the deferral of knowledge. The dissertation pays particular attention to the individual's perceptions of the team, the supervisor, and self-perceptions. Additionally, the effects to what extent the supervisor has an influence on the individual and the knowledge hiding are investigated. With the objective, the following research questions (RQ) are addressed:

RQ1: What implications for knowledge management behavior in cross-functional teams can be derived from the existing studies?

RQ2: To what extent do self-perception and supervisor perception influence knowledge hiding in cross-functional teams?

RQ3: To what extent does the individual's perception of the cross-functional team influence knowledge hiding?

RQ4: How can leadership influence the perceptions of cross-functional teams to prevent knowledge from being hidden?

To answer RQ1, it is necessary to consolidate previous studies in the field of cross-functional teams. Within a literature review in Chapter 3, all practices, methodologies, approaches and studies are highlighted and discussed. Here, the focus is on the literature dealing with coopetition of cross-functional teams, which address success practices, factors, and aspects on knowledge. Chapter 3.1 explains the common definition of important terms for the dissertation. The systematic review is organized as follows: Chapter 3.2 uses the systematic approach of Moher et al. (2009) to filter

relevant literature, followed by a content analysis in Chapter 3.3, where the main statements are generalized and structured to answer RQ1. Chapter 3.4 concludes the review with implications and future research directions.

Based on the results of the literature review, seven hypotheses are formulated for RQ2, 3, and 4. The derivation of these hypotheses is done in Chapter 3.5. In order to answer RQ2, 3, and 4, the hypotheses are empirically tested. Chapter 4 discusses the material and the empirical procedure. The analysis is conducted in Chapter 5.1. The analysis includes three independent sub-studies, the first being addressed in Chapter 5.1.1, the second in Chapter 5.1.2, and the third in Chapter 5.1.3. Chapter 5.2 is discussion theoretical and practical implications from the results. Chapter 6 is showing limitations and conclusions of the dissertation. The dissertation ends with a summary of new scientific results in Chapter 8.

3 LITERATURE REVIEW

3.1 Definitions

In this Chapter, following the bottom-up approach, the important terms are defined, with which significantly the dissertation deals.

3.1.1 Cross functional team

Assigning tasks, projects or problems to a team composed of multidisciplinary individuals increases creativity levels (Yong et al., 2014) and creates a shared mindset. Each member offers an alternative perspective on the problem and a possible solution to the task. Individuals of a cross-functional team must be prepared to participate in various aspects of teamwork as they are responsible for their cross-functional team tasks in addition to their normal day-to-day responsibilities.

It enables the company to break down hierarchical structures, as cross-functional teams are composed of individuals from different positions (Henke et al., 1993). Particularly in large companies with a high hierarchy, cross-functional teams can be used to create synergies between different departments in order to improve performance (Naidoo & Sutherland, 2016; Strese et al., 2016a, 2016b), innovation (Chen et al., 2020a, 2020b) & the relationship (Ghobadi & D'Ambra, 2012a, 2012b, 2013; Knein et al., 2020) within and between teams.

In addition, decisions are made in a decentralized manner (Henke et al., 1993). This lateral decision making allows for shorter turnaround times, increased motivation through clearly defined areas of responsibility, and a creation of greater accountability within the team. This autonomy results in information being processed within the teams so that hierarchical information is not overloaded at the upper level (Henke et al., 1993).

However, when introducing cross-functional teams, it is important that the concept behind them is really understood and that there is a willingness to change traditional framework conditions. A good example of this is competitive orientation in relation to conflicting management goals and expectations that cannot be met for every department at the same time. For example, in a project team, the warehouse department might have as a goal the reduction of stock capital lockup through low stock levels, while the sales department might have as a goal to ensure the availability of products for sale, which results in the need to have stock levels at a certain level. This generally leads to an "us versus them" principle and thus intra-departmental optimization (Ambrose et al., 2018), which are not optimal conditions to work cross-functionally together. To counteract this,

the vision should instead be derived directly from the strategic goals of the organization - and all team members should see the achievement of this vision as their common task.

3.1.2 Coopetition

Recognizing that new technological opportunities arise over time, all departments of a company must face challenges that are not specifically related to one responsible area within the company. As a result, the concept of "coopetition" was developed, where rival departments with differing objectives put their competition aside for a time to address their common challenges. Despite the immediate rivalry, competition can coexist with cooperation (Le Roy & Czakon, 2016). Finally, the main driving force of firms is the pursuit of increasing their competitive advantages to become better in the market, exploring each other's expertise for private gains and control over their knowledge (Hamel et al., 1989), refraining from internal rivalries when necessary (Le Roy & Czakon, 2016).

In recent years, the term "coopetition" has received increasing attention in research (Bengtsson & Raza-Ullah, 2016; Dorn et al., 2016; Ghobadi & D'Ambra, 2012a). It is consistently believed that coopetition between organizations - the simultaneous presence of cooperation and competition - has a positive impact on various areas of organizational performance. These areas include, for example, innovation (Estrada et al., 2016; Gnyawali & Park, 2011), customer satisfaction (Luo et al., 2006), and areas such as trust and commitment (Morris et al., 2007).

On the other hand, cooperation with competitors can also lead to tensions that reduce benefits and cause losses for companies (Bouncken & Kraus, 2013; Ritala & Hurmelinna-Laukkanen, 2013; Zineldin, 2004). Lado et al. (2006) point out that firms can succeed or fail as they deal with these paradoxes between cooperation and competition. According to Klimas (2016), it is critical to harness these paradoxes and tensions for oneself to ensure a successful strategy. This is not always trivial, as previous studies have shown that cooperation between competitors has often led to failure (Lunnan & Haugland, 2008; Park & Ungson, 2001).

The concept of coopetition precedes a history. In 1997, the concept of coopetition in entrepreneurial situations was adapted based on what is known as game theory (Nalebuff & Brandenburger, 1997). Among the key propositions was that rival groups should not compete but cooperate and offer joint concepts and solutions to achieve market advantages. Pioneers of the coopetition strategy also included Lado et al. (1997) and Bengtsson and Kock (1999), who saw the greatest potential for performance improvement in neither pure cooperation nor pure competition, but in coopetition. In discussing the concept of coopetition, it is critical to consider the level and dimension of cooperation among groups. This observation can be categorized by

indicating the extent of knowledge sharing and sharing of business practices (Bendig et al., 2018; Dorn et al., 2016; Le Roy & Czakon, 2016; Luo et al., 2006).

While in the past the focus was mostly on higher level, such as entrepreneurial efforts to compete within and between networks, ecosystems (Dorn et al., 2016; Lascaux, 2020), at the same time the relevance of coopetition also became apparent on an intra-firm level.

For example, Walley (2007) reports cross-functional cooperation between departments that compete for financial resources but have as a common goal the economic sale of the same product. This double-edged sword leads to the contradiction that characterizes other stages of coopetition: Although they must work together to succeed, they compete for resources on the same team. Thus, the paradox exists not only between networks and firms, but also at the team level (Luo et al., 2006). Tsai (2002) characterizes cross-functional coopetition as shared competitive and cooperative behaviors across departments. Devece et al. (2019) adds to the definition by extending cooperative behavior between teams and individuals to the team level under the term interdisciplinary coopetition. While at a higher level, organizations can offload established goals and structures onto individuals, things play out differently at the individual level. Individuals often act subjectively according to no thoughts and motivations and are influenced by perceptions of the environment (e.g., toward the team, self-perception, or supervisor).

However, creating benefits from collaboration with an internal rival group through knowledge sharing also risks extracting internal and (previously) secret knowledge, resulting in weaknesses or past advantages being exposed to the competitor (Sanou et al., 2016). Ultimately, this situation leads to a paradox: knowledge disclosure is the purpose of coopetition, but it also limits potential outcomes and knowledge for all parties involved, while at the same time intellectual capital should be withheld as much as possible (Bonel & Rocco, 2007). Consequently, Luo et al. (2006) outlined cross-functional coopetition and referred to it as a "double-edged sword" of cooperative and competitive behaviors. They found that both behaviors have positive effects on knowledge transfer and performance in marketing, with deliberately transparent behavior in semi-hostile environments making it unclear what potential was missed due to limited knowledge sharing. Table 1 shows common definitions of coopetition on different perspectives from the most cited papers on coopetition.

Table 1 Common definitions of coopetition

Author(s)	Definition
(Nalebuff & Brandenburger, 1997)	The overarching goal is to create a mutually beneficial exchange and add value for both partners. It is about transforming the market from a zero-sum game where there is only one winner to an environment where the end result benefits the whole and is more profitable for all.
(Raza-Ullah et al., 2014)	Coopetition is collaboration and competing companies between firms where both benefit, e.g., Apple and Google
(Gnyawali & Park, 2009, 2011)	Through alliances and other partnerships, companies aim to improve performance by being able to share risks, resources and expertise.
(Ghobadi & D'Ambra, 2012a)	In cross-functional teams, members may hoard or incompletely share knowledge they consider important. This different characteristic affects knowledge sharing practices and can be explained by the concept of cooperative knowledge sharing.
(Bouncken et al., 2015)	Coopetition is a dynamic process between stakeholders that aims to create a business pie and mutual value through collaboration, while stakeholders compete for the biggest piece of the pie and the biggest share of the value.

The dissertation narrows down the concept of coopetition. First, coopetition is treated at various levels in past literature. The majority of the literature treats coopetition at a higher level, which examines, for example, the interaction between networks or larger companies (Gimeno, 2004; Gnyawali & Madhavan, 2001; Golnam et al., 2014; Kim et al., 2013, 2013; Leite et al., 2018; Peng & Bourne, 2009; Rusko, 2014). On the other hand, the role of coopetition has also been addressed for small businesses, start-ups, and family-owned businesses (Granata et al., 2018; Kraus et al., 2019). Even though the literature of higher level has continued to multiply in recent years (Hani & Dagnino, 2021), research of coopetition at the team level has not gone unnoticed. For example, Bouncken et al. (2015) stated that the coopetitive interactions exist on different levels. They can be divided in individuals (Enberg, 2012), teams (Baruch & Lin, 2012; Ghobadi & D'Ambra, 2012b) and also at the intraorganizational level within companies (Luo et al., 2006; Tsai, 2002). A similar view is also shown by Dorn et al. (2016) who distinguishes the levels at inter-firm, intra-

firm and network level, while Gernsheimer et al. (2021) divides the levels into inter-firm, intra-firm, network, individual, team and project-level.

The content of coopetition is mainly in the economic business context. Thus, most of the literature in the area of high-tech airline (Chiambaretto & Fernandez, 2016; Fang & Wang, 2020; Klein et al., 2020; Kraus et al., 2019), automotive (Akpinar & Vincze, 2016; Albort-Morant et al., 2018; Hani & Dagnino, 2021) IT (Basaure et al., 2020; Pellizzoni et al., 2019; Qin et al., 2020; Renard & Davis, 2019; Song et al., 2020; Trabucchi & Buganza, 2021; Xia & Niu, 2020) and manufacturing (Chai et al., 2020; Estrada & Dong, 2020; Rajala & Tidström, 2017) examined.

Methodologically, coopetition is evolving in several directions. Most scholarly articles use qualitative methods, mostly case studies, followed by quantitative methods and conceptual models, which is not surprising given the complexity of coopetition (Bouncken et al., 2015).

Meanwhile, the term coopetition categorizes into different theories. In the origin of coopetition, the term developed from game theory around economic research as described in the introduction (Mariani, 2007). Relatively shortly thereafter, the term focused on cooperation and competition to control companies (Luo et al., 2006). Following the publication of Brandenburger and Nalebuff (1997) publications multiplied to other aspects such as the management of scarce resources, dynamic capabilities of firms, and most recently, psychological perception (Ghobadi & D'Ambra, 2012b; Ton, 2021; Ton et al., 2022b).

Supply chain relations play a special role, as the treatment of coopetition between firms between buyer and supplier allows competition and cooperation to prevail at the same time (e.g. Eriksson, 2008; Gurnani et al., 2007; Lacoste, 2012). They can run vertically along the supply chain (e.g. Kim et al., 2013) or horizontally alongside other suppliers from the same component level (e.g. Wilhelm, 2011; Zhang & Frazier, 2011). Considering the team level, coopetition can play the relation of many roles, such as short-, medium-, and long-term teams, cross-functional teams, and teams from the same department. The goals of most publications on coopetition are to promote innovation, to optimize knowledge transfer from one department to another and to improve the quality of work (Brolos, 2009; Ritala, 2001), the optimization of knowledge transfer between companies (Enberg, 2012; Ritala & Hurmelinna-Laukkanen, 2013) or the strengthening of market conditions (Luo et al., 2006). As an example, Luo et al. (2006) found a positive correlation between cross-functional coopetition on performance. Lin (2007) presents ambiguous results in analyzing the impact of cross-functional cooperation. Positive results are obtained for the cooperative aspect of coopetition, while the competitive branch remains ambiguous. Similarly, Lin et al. (2010) reveal a positive correlation between cooperation and work effectiveness, while competition remains non-significant.

This suggests that it is not currently possible to conclude unambiguous patterns of effect in the area of cross-functional coopetition. Inconclusive results indicate that research knows too little about the evidence on which it is based to arrive at reliable results.

Figure 1 shows different categories that the literature has addressed. Coopetition, as previously described, can be differentiated by role (vertical versus horizontal coopetition, cross-functional...), by content (efficiency power, market power, knowledge), by theory (dynamic and game theory, resource-based and dynamic capabilities), and by level (intra-firm, inter-firm, team-level) (Bouncken et al., 2015). In the context of the dissertation, coopetition is treated within interpersonal perceptions of cross-functional teams and is directed at the behavior of the individual towards himself, the team and the supervisor and is thus classified in the micro-level (marked bold in Figure 1).

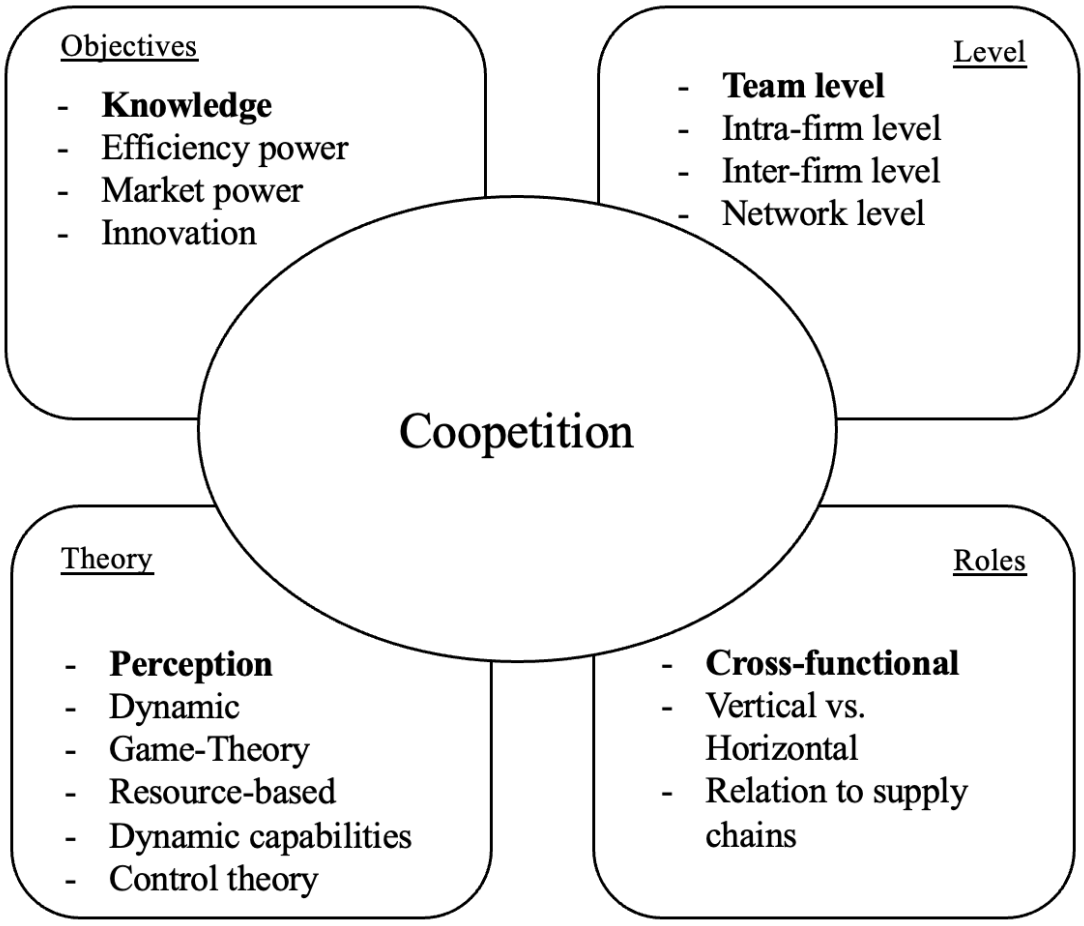


Figure 1 Coopetition dimensions

Source: author's illustration based on (Bouncken et al., 2015)

The studies and their findings at the micro level (team level, individual) are relevant to this dissertation. There are no related studies that concentrate on examining the effects of coopetition

on a specific variable such as knowledge management, so a research gap can be identified at this point.

In contrast, the existing literature covers a broad body of knowledge on display trends of coopetition itself. A comprehensive review of empirical studies on other levels outside the micro level of coopetition is not provided due to the focus of this dissertation. For the higher levels in particular, there is a large body of research on methodological applications. There is also variation among studies on how cross-functional coopetition is measured (Ghobadi & D'Ambra, 2012a). On these studies, the reviews by T. J.-A. Peng et al. (2012), Bengtsson and Kock (2014), Devece et al. (2019), and Bouncken et al. (2015) have provided relevant findings.

In terms of the methodological scope of the literature, it is noticeable that most studies do not define which specification of cross-functional interface they investigate. This suggests further research gaps, as depending on the type of team, for example, whether it is long-term or short-term teams have different effects of coopetition.

3.1.3 Knowledge management in cross-functional teams

Coopetition between two or more different departments also carries the risk of intellectual and therefore personal discourse. Employees within the same company may not identify as a common unit, both because of their origins and because of their emerging rivalry after the competition-based project. Implicit knowledge might be intentionally withheld, as social knowledge that arises from team spirit and corporate identity is no longer held by all members. This development could amplify into a possible "us versus them" mentality as two functional groups from Department A and Department B must work together and adapt to each other (Ambrose et al., 2018). Rewards and recognition for employees could increase constructive attitudes among non-executives, but different personalities who are on the same or different teams react differently to internal competition, seeing it as either encouragement or exploitation (Naidoo & Sutherland, 2016). In addition, shared resource pools, different goals, and backgrounds of team members can also create tensions that translate into lower team performance (Pee et al., 2010). To overcome these risks, collaborators need to create a shared identity during collaborative activities, which underscores the importance of collaborative leadership (Gnyawali & Park, 2011; Raza-Ullah et al., 2014).

The chapter focuses on gaining insights into the benefits of knowledge management in the cross-functional team collaboration environment. The specifics of coopetition are addressed, highlighting the differences within and between teams in the intra-functional environment and comparing them to current industry-standard approaches to collaboration within the boundaries of

organizations. These findings are categorized into three groups, ranked by the time required to successfully measure these factors.
Therefore, the following research question was posed for the chapter:

RQ1: What implications for knowledge management behavior in cross-functional teams can be derived from the existing studies?

Due to this wide range of aspects that have different influences on coopetition, current research lacks a clear synthesis of previous findings. To reflect the current state, the literature review examines the factors and aspects that have contributed to cross-functional team collaboration over the past decade.

3.2 Procedure

Several systematic literature reviews were conducted on the topic of coopetition. Dorn et al. (2016) analyzed articles on the topic of coopetition using three academic databases and ten relevant academic management journals ranked by Web Of Science using the keywords "coopetition, cooperation, competition." A total of 169 applicable articles were found after filtering. The literature was grouped and then divided into different phases, such as the initial phase, the management phase, and the evaluation phase, but also into different levels, such as the network level, the inter-firm level, and the intra-firm level (Dorn et al., 2016). At the same time, Bengtsson and Raza-Ullah (2016) published a systematic literature review and came to similar conclusions in classifying the relevant articles into the intra-firm, dyadic, triadic and network levels. It is noteworthy that only 5% of the relevant literature refers to the intra-organizational level. In addition, the results of the different literature were categorized as innovation, knowledge, performance, and relationships. Following Bengtsson and Raza-Ullah (2016), the methodology follows these categories to classify the articles. Bouncken et al. (2015) identified 82 articles using the keywords "co-op* and coop*" in various literature databases. They also provide insights into potential dimensions for future coopetition studies, ranging from micro-level (individual) to macro-level (inter-firm, network).
The systematic review is based on the PRISMA approach (Moher et al., 2009). In a first step, the literature is extracted from different literature databases. In this study, the following search terms were applied to texts, titles, abstracts, and keywords provided by the authors to evaluate the databases: "cross-functional coopetition, interdepartmental coopetition, interdisciplinary coopetition". These search terms were entered into each database. These generic terms were

chosen because the terminology and results of the studies are rarely found in coopetition studies and are often found in other theories (Dorn et al., 2016). With the generic team level in mind, these keywords were deemed most useful. It should be noted that there is a wide range of articles that may be considered applicable; therefore, some restrictions should be made to narrow the search. First and foremost, only English-language publications that are frequently cited were considered because of their high traceability and quality (Lukassen & Wallenburg, 2010). The automated database search was limited to literature published from 2010 to 2021. Subsequently, the evaluated literature publications were limited to the following areas:

1) The literature needs to address the coopetition of cross-functional teams;
2) Focus on the industrial sector; and
3) They must address success practices, factors and aspects on tacit knowledge.

Table 2 Review protocol

Research question	What implications for knowledge management behavior in cross-functional teams can be derived from existing studies?
Information sources	Sources: Emerald, Elsevier, Google Scholar, JSTOR, SpringerLink, WebOfScience.
Filter criteria	Publication date: 2010 - 2021 Language: English only research publication included
Search words	cross-functional coopetition OR interdepartmental coopetition OR interdisciplinary coopetition
Search strategy	Selection Process: Only articles that address success practices, factors of cross-functional teams with a focus on knowledge management behaviors.
Synthesis of the data	Qualitative synthesis: articles are briefly presented, focusing on success factors and practices. These aspects are grouped together to answer the research question.

Source: (Ton & Hammerl, 2021)

In the first procedure, the search terms described in Table 2 are entered crosswise. The combinations are repeated for all databases. The automatic database search yielded 2,597 hits. After filtering by publication year, publication date, publication type, language, and searching only in title, abstract, or the specified keywords, the database search yielded 528 hits for the literature databases (Table 3).

Table 3 Filter criteria

Database	Total results	Year 2010 - 2021	Only peer-reviewed articles	Results after filtering
Google Scholar	1960	1590	-	100
JSTOR	192	119	112	112
Science web	40	38	38	38
Elsevier	188	161	138	138
Emerald	148	130	123	123
SpringerLink	69	67	17	17
Total	2597	2105	428	528

Source: (Ton & Hammerl, 2021)

Since all databases contained redundant journals, 29 articles were removed due to this phenomenon. The remaining 499 hits were evaluated based on the title and abstract as to whether they could contribute to answering the research question. Here, a subjective evaluation is crucial for further filtering. The results examined were classified as not relevant if the articles did not address cross-functional team coopetition. First, articles that did not address both coopetition and competition as main concepts were excluded, e.g., Ali Köseoglu et al. (2016), Rafi-Ul-Shan et al. (2018), and Zhao and Peng (2018). Secondly, some articles dealt with a too limited scope of inter-department work instead of cross-functional teams, e.g., Burström (2012), Chai et al. (2019), Hani and Dagnino (2020), and Soppe et al. (2014). Third, certain articles were removed when coopetition was used only as a keyword but the article was not related to business or management (Holgersson et al., 2018; Zuccalà & Verga, 2017). After screening the titles, 246 hits remained, and 173 articles were further removed after screening the abstract for lack of relevance. Finally, the remaining 73 publications were fully screened. The search for recent publications identified a number of studies that addressed coopetition as a general feature in industrial companies, but were judged to be unspecified in terms of the methods, procedures, etc. used. These studies were therefore discarded. In total, 21 of the 73 publications were relevant to the systematic review. From the screening, the references of the relevant studies were also reviewed, resulting in additional publications that were also relevant. Thus, 4 additional articles were included in the review (Figure 2).

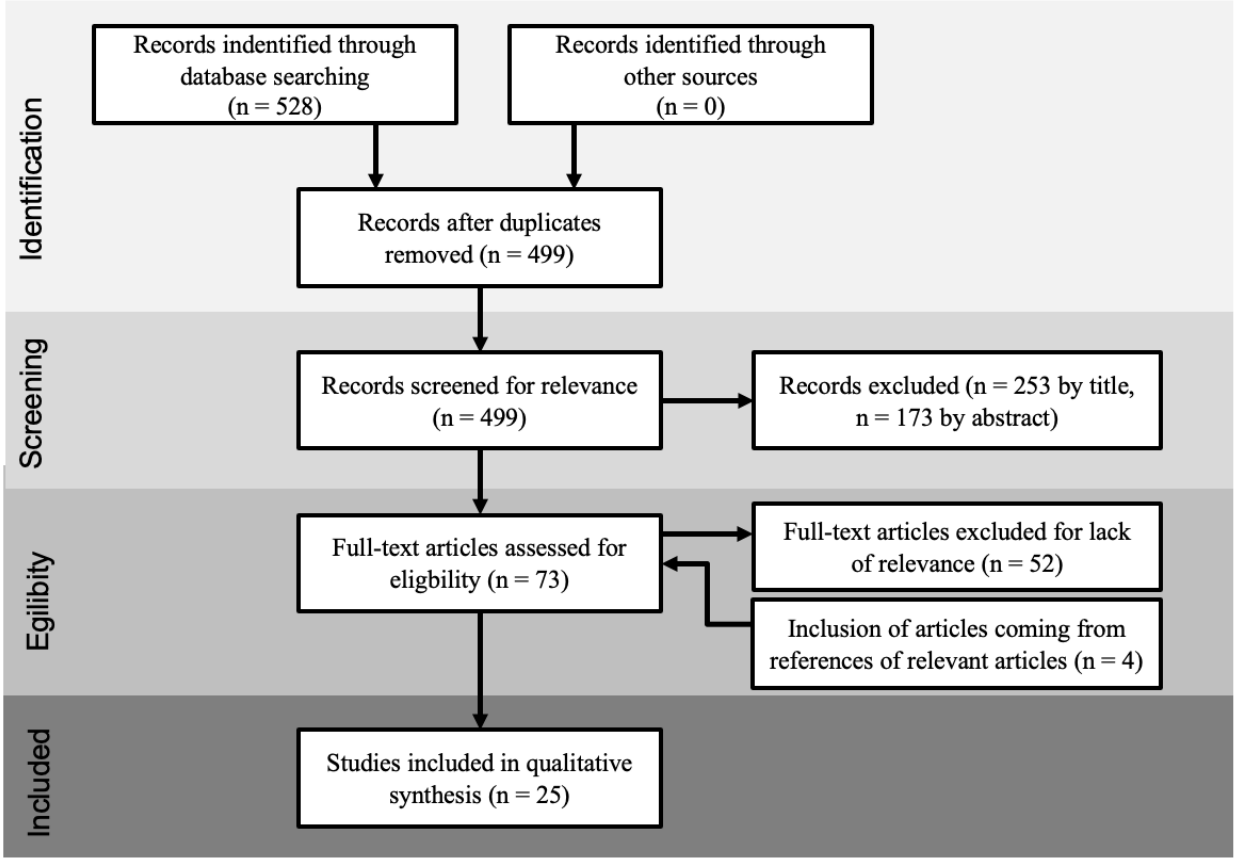


Figure 2 Paper screening process based on the PRISMA model

Source: author's illustration based on (Moher et al., 2009; Ton & Hammerl, 2021)

3.3 Generalization of the main statements

Based on the literature reviewed, publications have addressed knowledge sharing and the impact of cooperation (Chiambaretto et al., 2019; Ghobadi & D'Ambra, 2012a, 2012b, 2013; Lin et al., 2010; Nguyen et al., 2018; Phong Nguyen, 2020; Zhang & Guo, 2019). Direct cooperation manifests in extended communication, fostering relationships, and team-based task orientation. These processes correlate positively with knowledge sharing behaviors (Ghobadi & D'Ambra, 2012a; Lin et al., 2010).

However, coopetition between two departments creates additional challenges as formerly rival parties interact with each other, often in converging ways. This effect can occur within newly formed work groups or between two teams, both of which are trying to achieve their goals. As resources are limited and management sets clear goals, the perception of competition prevails, which has a negative impact on knowledge sharing (Chiambaretto et al., 2019; Ghobadi & D'Ambra, 2012a). Competition for scarce tangible resources helps team members work

cooperatively, while competition for intangible resources reverses the mechanics and eventually leads to more competitive team communication and task orientation (Ghobadi & D'Ambra, 2012a). Ghobadi and D'Ambra (2013) point out the lack of connection between team members and argue that various interdependencies between team members help to strengthen interactivity. It reduces competitive thinking, enabling the accumulation and acquisition of strategic knowledge (Ghobadi & D'Ambra, 2013).

In addition to the ease of sharing knowledge through multi-party sharing, aligned leadership is also a relevant factor influencing the interaction of cross-functional teams (Strese et al., 2016a).

The article by Strese et al. (2016a) addresses the principle of considerate and participative leadership. Considerate leadership is a leadership behavior that emphasizes a commitment to developing personal relationships with the team and facilitating collaboration among team members. Participative leadership is characterized as a leadership behavior in which all members of the organization work together to make decisions. Elements of both considerate and participative leadership enable the necessary emotional and respectful environment for productive efforts on the one hand, and on the other, involve all team members equally in decision making to foster a sense of responsible action rather than simple task completion. This reduces redundancy and allows common standards and methods to be established (Chiambaretto et al., 2019). Different manifestations of factors such as gender, task activity, education, and knowledge base positively influence interpersonal exchanges (Liu et al., 2020). Neglecting these principles of interpersonal interaction can lead to devastating side effects, as more experienced team members in particular can slow down or even block the concept of team-based work because they do not receive the professional recognition of their entire career path and thus accumulate an extensive knowledge portfolio.

By limiting teamwork to a few hierarchical levels, and thus fewer communicative boundaries between team members, the power distance between supervisors and team members can be reduced, effectively increasing performance and avoiding unclear goals or tasks (Schneider & Engelen, 2015). However, successful teamwork requires the full utilization of knowledge heterogeneity. This factor is enhanced by the adapted leadership method, which further increases performance in cross-functional teams (Zhang & Guo, 2019). Each team member must understand the importance of knowledge heterogeneity and how to access the specialized knowledge of different team members to avoid knowledge asymmetries. Knowledge heterogeneity indicates how well shared knowledge is distributed across the team. An imbalance in the relationship of the team members jeopardizes the team climate because common approaches cannot be executed in a coordinated space. A damaging climate also prevents the use of cross-functional knowledge and

technologies developed by other business units, as personal animosities block knowledge transfer (Chiambaretto et al., 2019). So-called knowledge brokers can help by promoting knowledge sharing within an organization. Chiambaretto et al. (2019) further explored the topic through a qualitative analysis and found that knowledge brokers can create benefits in knowledge sharing between companies, within a company, and for a project team. To ensure their success, they must manage internal coopetitive tensions. This can be achieved by protecting the competitive advantage of companies by reducing the cost of sharing through standardization of innovative solutions and increasing awareness and trust in innovative solutions by centralizing knowledge sharing. Facilitating interpersonal relationships between teams allows the building of constructive criticism and a courteous and productive tone that enables better understanding and problem solving in upcoming critical situations. Getting departments to open up about their competitive advantages is a difficult challenge, as no company willingly gives up their departmental dominance. The resources invested, the time spent and, most importantly, the risk taken to obtain specific knowledge are considered too valuable to be shared so easily. Nevertheless, there are mechanisms to postpone the release of such knowledge in cooperative situations. The introduction of so-called lagging processes allows for a defined time frame in which pioneers of innovative knowledge can capitalize on their ideas, while project partners can catch up with these ideas after a certain period of time and also gain benefits for their department (Albort-Morant et al., 2018).

However, these processes only touch on subliminal and clearly identifiable knowledge developments and often hide the necessary steps for tacit knowledge generation. Regular meetings and social networks built on regular interactions and trust strengthen team cohesion (Seran et al., 2016). In this way, the diverse origins of team composition can be respected and valued without anyone feeling excluded. Thus, the relationships within and between team members, supported by the local organizational structure itself, lead to great benefits for direct productivity. An et al. (2020) argued that organizational identification of teams can have a critical impact on productivity both between and within teams. Through a shared organizational behavior proposed and followed through a top-to-bottom approach, methodical and thus time- and resource-intensive processes not directly related to the group's mission can be completed in a short time frame.

In addition to the explicit organizational structure, interpersonal relationships are the key factors for a professional and productive relationship in different teams that compete with each other. Different coordination styles such as decentralization, formalization, informal networking, and lateral relationships often lead to unconsciously generated knowledge that is essential for cross-functional knowledge sharing (Phong Nguyen, 2020). Further social interaction and

familiarization of all team members with shared, individualized norms and perspectives in cooperative environments enable the growth of trust and social capital (Baruch & Lin, 2012).
Social capital refers to the concept of normative cohesion of groups, characterized, for example, by interpersonal relationships, shared norms, values and trust. It is crucial for achieving higher team performance and thus for the emergence of team-specific competencies. In addition, the factor of shared cultural understanding makes a significant contribution to efficient knowledge management. Group identity, development and error management culture correlate positively with cross-functional coopetition (Knein et al., 2020). Finally, job rotation and shared rewards are also important drivers of performance improvement in a coopetitive environment, with smaller companies benefiting more as their human resources are limited and they therefore rely on the individual expertise of each team member (Thongpapanl et al., 2018).
Achieving direct results and thus increasing productivity and efficiency correlate directly with a company's financial goals and, in most cases, shareholder interests that can be measured from the outside. Organizational and human relations impacts reflect internal, day-to-day business practices that take weeks to months to successfully establish and represent the social component. The third key missing component is institutional and thus pending business decisions that shape innovation perspectives. Innovation management is defined by the interaction of multiple effects and cannot be broken down into objective or direct necessities. Rather, coordinated and long-term efforts must be made to achieve innovative results. Due to the lengthy effort and high risk of potential misdevelopment, most companies rely on incremental innovations, as recent achievements can be maintained and investments kept in check. However, radical innovations are those that promise the highest return on investment, as they not only break the current status quo, but also create new markets, customer interest, and thus growth. Coopetition offers the greatest potential for these radical innovations (Chen et al., 2020a, 2020b; Strese et al., 2016b). In this context, innovation is addressed through the introduction of a new product, a new market, but also through service innovations such as new service concepts, new customer interactions, and more (Chen et al., 2020b). Through the experience of multiple departments represented in these cross-functional teams, various initial outcomes of both radical and incremental ideas can be combined, reducing the financial and business risk of specific technological concepts as unresolved issues of one party can be complemented by the other and knowledge is synthesized (Chen et al., 2020a). At first glance, these effects appear to be exclusive to corporations and thus to finance-related businesses. However, this phenomenon is not unique; nonprofit organizations can also benefit from these methods. Although the motivation to cooperate and compete in for-profit organizations is driven by monetary aspects and nonprofits pursue more idealistic goals, ideas alone are not sufficient for

successful knowledge exchange. NPOs may have a lower level of competitiveness, while profit companies are more willing to trigger such an effect. Aspects such as funding or planning expenditures still pose a threat if not addressed cooperatively (Moczulska et al., 2019).

Table 4 shows the qualitative synthesis of the identified literature. The articles are presented according to three dimensions that have an impact on knowledge management: Performance, Relationships, and Innovation. When classifying the results, it should be noted that these factors often overlap. Therefore, the classification was made after a subjective review based on the most obvious result.

Table 4 Summary of the most important social aspects from the literature review

Knowledge management					
Result	**Relevant factor**	**Classification**	**Gain**	**Literature**	**Journal**
Performance-related result	Interdependence of cross-functional teams	Knowledge advantage	Reducing the cost of sharing	Ghobadi and D'Ambra (2013) Zhang and Guo (2019) Strese et al. (2016a)	Information Processing and Management Information and Management Industrial Marketing Management;
	Task orientation and clarification		Coordination	Ghobadi and D'Ambra (2012a) Ghobadi and D'Ambra (2012b)	Journal for Knowledge Management Journal of Systems and Software;
	Power distance	Power sharing	Fair and equal consideration of knowledge	Schneider and Engelen (2015) Bendig et al. (2018)	Journal of World Business; Industrial Marketing Management
	Job rotation		Knowledge diversification	Thongpapanl et al. (2018)	Entrepreneurial Behavior and Research
	Common reward				
Relational result	**Leadership** (communication and social interaction)	Informal networking and psychological incentives	Knowledge Mediator	Ghobadi et al. (2012b) Nguyen et al. (2018) Baruch and Lin (2012) Chiambaretto et al. (2019) Albert-Morant et al. (2018), Liu et al. (2020)	Journal of Systems & Software Industrial Marketing Management Technological Forecasting and Social Change Review of Managerial Science Journal of Knowledge Management
	Climate (shared vision and mission, trust)	Decentralization	Coordination	Lin et al. (2010) Nguyen et al. (2022)	Computers in Human Behavior; Journal of Business Research
		Lateral relations	Distributed responsibilities	Lin et al. (2010) Nguyen et al. (2018) Seran et al. (2016)	Computers in Human Behavior Industrial Marketing Management
	Self-perception (organizational and cultural learning)	Promoting organizational cohesion and efficiency	Social cohesion	Naidoo et al. (2016) Strese et al. (2016b)	South African Journal of Business Management Industrial Marketing Management
		Common organizational identity		An et al. (2020)	Industrial Marketing Management,
		Respect and support individualism		Knein et al. (2019)	Journal of International Management
Innovation	Combination of the above factors and methods over a longer period of time.		Radical innovation, especially in the product	H. Chen et al. (2020) M. Chen et al. (2020)	Journal of Business & Industrial Marketing

Source: (Ton & Hammerl, 2021)

3.4 Implications and future research directions

The relevant publications on cross-functional coopetition were grouped according to their content in Table 4. It can be seen that cross-functional team coopetition leads to changes in various knowledge-related outcomes. Finally, these outcomes were divided into the effects on the research areas of performance management, relationship management, and innovation.

Based on the results, knowledge was assessed as a crucial resource and a decisive factor for successful strategic competitiveness. However, facilitating knowledge sharing alone can be considered insufficient. Remarkable performance developments can be achieved within organizational boundaries through the modification and adoption of new processes (Yang, 2010), leading to a direct reduction in sharing costs as processes are streamlined and enable operational benefits. These costs are quantifiable as neglecting performance leads to longer project timelines, failure to achieve internal goals, or even destructive behavior by team members due to unforgiving strict rules set by superiors. Coordinated efforts and a shared understanding of knowledge practices are the foundation for fundamental collaboration, as without them a team-based approach would be impossible. This effect, often referred to as process management, is equally valued by entrepreneurs of all sizes (Reich et al., 2014) because it enables slow and incremental change over a predefined timeframe while preserving previous investments. Results, often referred to as quick wins or gains, increase the risk of limited focus on existing products and services, delaying radical approaches (Kemp, 2000).

Paying attention to the impact of cross-functional coopetition, the next step is the interpersonal relationship of the teams within the company. Communication and social interactions are seen as key factors here, especially through previously unused channels that usually create deeply connecting informal networks. As a result, building trust and respect together is essential, as only a shared conversation enables the dissemination of a common vision and mission, decentralizes the work environment, and eliminates the need for constant control and monitoring. Supported by a unique organizational and cultural learning structure, companies can ensure that organizational cohesion is maintained while the cross-functional team adheres to predefined goals and benefits from other organizational units within the same business ecosystem. In addition, an appropriate tone and individual focus can be achieved, enabling further progress in interpersonal relationships. In addition, balancing capacity and lower emotional capacity leads to a positive indirect effect of tension on performance (Raza-Ullah, 2020).

However, this process takes an indeterminate amount of time as individual team members have individual approaches and social mindsets. Moreover, pure diversity and understanding among team members alone do not lead to improved performance (Urionabarrenetxea et al., 2021). The high level of competence of the team leader and the prior experience of the team members has a significant impact on the success of a team project. This makes long-term and repeated cross-functional team practice irreplaceable, as strategic advantages can be achieved through the accumulation of previous short-term successes. Consequently, individually tailored teams require personalized organizational and communication patterns rather than generically applied methods that focus on pure performance (Barendsen et al., 2021). As a result, individual management practices can be less and less directly defined, as each company needs its own and individual knowledge management strategy to achieve the goal of long-term profitability.

Long-term investments that embody innovation are often ignored due to the "high risk, high return" approach. However, issues of global scale, especially the need for economization at the industrial level, make a shift toward better strategies essential (Ha et al., 2016) and penalize refusal to challenge the status quo. Therefore, innovation can be seen as a direct consequence of knowledge management (Mardani et al., 2018), which is fostered by cross-functional team collaborations.

Related to the present RQ1, the use of coopetition in internal and external scenarios during teamwork has short-, medium-, and long-term effects that shape the future development of practicing companies at the methodological and interdisciplinary levels. Thus, each factor was extracted from the literature review, ordered and categorized according to the impact of profitability and the time horizon necessary to develop it effectively (see Figure 3). It should be noted that as time progresses, provided that the aforementioned factors are present, unregulated innovation, which increases competitiveness, can be achieved step by step (Moradi et al., 2021).

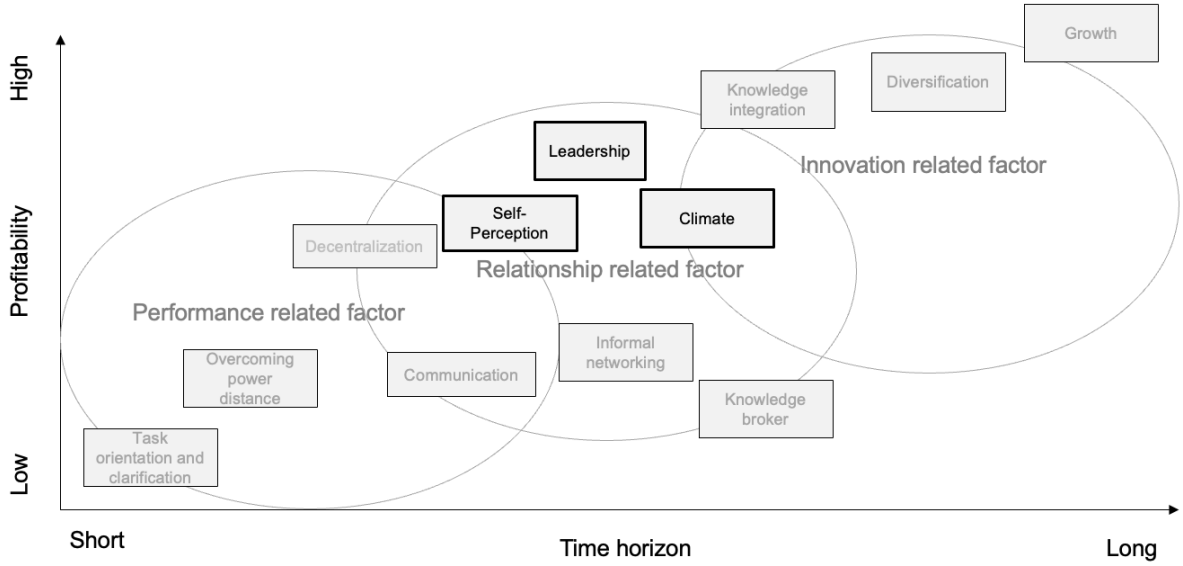


Figure 3 Classified factors assigned to the "profitability" and "time horizon" dimension

Source: author's illustration based on (Ton & Hammerl, 2021)

From the concepts of influencing profitability in relation of time spent, it appears that factors from the relationship level in particular represent the best relationship between time horizon and profitability in knowledge management (see Figure 3). The factors leadership, self-perception and climate in particular are rated relatively highly in the "relationship" dimension. These are shown in bold in Figure 3.

Having relationship related factors as the highest ratio of time horizon and profitability was not surprising, since it is mainly factors at the personal level, the interpersonal level, and external influence, such as from the manager, that can cause team members to withhold their knowledge from other members (Ton et al., 2022b). In such a negative example, knowledge transfer within and between cross-functional teams is significantly inhibited. With this result, RQ1 can be answered.

Furthermore, it is not always possible to clearly separate the influences at the performance, relationship and innovation levels. For example, the "communication" factor not only influences performance, but also the relationship level. The "personal attitude or personality" also has an influence on both the relationship of the team members and on the ability to innovate (see Figure 3). In reviewing the relevant literature, it was found that these often do not clearly refer to factors between and within cross-functional teams. Table 5 shows the summary of the analyzed studies distinguished into the three meta-levels and below that into "within-team" and "inter-team" coopetition.

Table 5 Result matrix at different levels

Legend: W-T: Within a team; I-T: Across teams; Source: author's illustration

Article	Impact on knowledge generation					
	Performance-based		Relational		Innovation-related	
	I-T	**W-T**	**I-T**	**W-T**	**I-T**	**W-T**
(Lin et al., 2010)		**x**				
(Ghobadi & D'Ambra, 2012a)	**x**	**x**	**x**	**x**		
(Baruch & Lin, 2012)		**x**				
(Ghobadi & D'Ambra, 2012b)	**x**	**x**	**x**	**x**		
(Ghobadi & D'Ambra, 2013)	**x**	**x**	**x**	**x**		
(Schneider & Engelen, 2015)	**x**					
(Raza-Ullah et al., 2014)			**x**	**x**		
(Strese et al., 2016a)	**x**					
(Seran et al., 2016)	**x**	**x**				
(Strese et al., 2016b)		**x**		**x**		
(Nguyen et al., 2018)	**x**				**x**	
(Raza-Ullah, 2020)	**x**	**x**	**x**	**x**		
(Chiambaretto et al., 2019)					**x**	
(Bendig et al., 2018)	**x**	**x**				
(Thongpapanl et al., 2018)	**x**	**x**				
(Zhang & Min, 2019)		**x**				
(Knein et al., 2020)			**x**	**x**		
(An et al., 2020)	**x**	**x**	**x**	**x**		
(Chen et al., 2020b)					**x**	
(Chen et al., 2020a)			**x**		**x**	
(Phong Nguyen, 2020)	**x**					
(Moczulska et al., 2019)	**x**	**x**				
(Liu et al., 2020)		**x**				
(Albort-Morant et al., 2018)	**x**	**x**				
(Naidoo & Sutherland, 2016)	**x**	**x**			**x**	**x**

It is critical to consider that the relevant literature comes from different industry sectors and journal with different focus. While this covers a broad spectrum of industry, it also summarizes different contexts and types of cross-functional teams. The validity of the literature review is therefore limited in the sense that while it uncovers key aspects in knowledge management, it can only provide a generic approach. A large focus of the relevant literature originates from IT, as it often deals with agile IT projects and time-limited IT teams (Ghobadi & D'Ambra, 2012b, 2013; Lin et al., 2010). Therefore, the result of the literature review also offers a call for future research to address other areas outside of IT. Particularly in times of crisis with the clear presence of competition in teams, research into all areas of business takes on relevance.

3.5 Derivation of the hypotheses

In the research, it is concluded that the aspect, and thus the potential impact, of coopetition between and within rival departments is not widely discussed in the context of cross-functional teams. The systematic review was used to cluster the results of current research, capture the context and background of team-based work approaches, and identify objectives that affect the impact of knowledge management.

First, most research focused on short-term factors influencing productivity. These have a direct and visible impact on the efficiency and ultimately the profitability of the firm. Performance-related factors are assumed to be more quantitatively measurable and have been measured more frequently in the past than innovation-related factors. (Ghobadi & D'Ambra, 2012a; Luo et al., 2006). These factors have been identified primarily as directly actionable explicit knowledge embodied by the position of each team member in their original corporate position.

It was noted, secondly, that the concept of innovation is hardly considered in recent research. From this, many companies focus on short-term profits rather than on long-term, innovation-oriented strategies. Due to the increasing need for radical innovation, driven primarily by changing perceptions of the customer environment, many companies that cling to their existing traditional products and values feel uncertain about taking large risks with potentially financial consequences. Coopetition can help steady strategies, as departmental experts are able to set apart their differences to address challenges that affect the company as a whole.

Lastly, to avoid direct intransparency between team members, the concept of knowledge brokers is important, as they can ensure the protection and capitalization of individual company secrets, while other participating companies can benefit and learn from the pioneer in a time-delayed manner. However, these considerations alone were deemed insufficient, since - apart from the superficial aspects - most tacit knowledge is generated through regular human relationships. Supplemented by a supportive organizational structure and the integration of each partner's individual competencies, team-exclusive niche competencies can be combined to become unique competitive advantages. However, this can only be achieved through a respectful and proactive team climate manifested in a shared vision, methodology and error management. Lower hierarchical barriers also facilitate knowledge sharing and reduce tensions in cooperative situations.

The study also contains limitations. First, methodologically, only six databases were considered. Although efforts were made to include all available research, there may be a risk that individual findings are overlooked. Another limitation of this systematic review is its restriction to

coopetition among cross-functional teams. Since coopetition between other groups, e.g., anchor departments or management, may also be considered within an organization, it is not addressed in this systematic review. Finally, it should be noted that coopetition should not be evaluated as a permanent and blanket method. The danger of relying only on coopetition projects in all areas of expertise increases the likelihood of streamlined decision making within the industry. This can lead to monopolistic approaches, where departments purposefully reject approaches other than the current one in order to defer investment costs and thus innovation. It is crucial that all innovation participants (institutions, public society and independent research institutions, companies and their direct stakeholders) are involved in the innovation process, otherwise lock-in effects and inefficient structures may result.

With regard to the relationship level, the literature lacks studies of the perception of persons. Especially in cross-functional teams, which have to work together under tension, different opinions and evaluations about other persons occur. Based on a person's expressions and actions, one infers his or her current mood, intentions, attitudes, and character traits.

Person perception can be divided into two models. While homogeneous teams from anchor departments tend to work together for longer periods of time and variables such as familiarity, connectedness, reliability, and commonality play a role in perceptions, in cross-functional teams, antecedents of judgment based on first impressions gain importance in rapidly changing teams. These tend to remain stable over the medium term. According to a review of literature on the accuracy and influence of first impressions on judgments, raters' first impressions correlate strongly with later ratings, but it is unclear exactly why this is the case (Wood, 2014).

In a study examining this stability, participants were asked to form impressions based only on photographs. Subjects did not judge the people depicted in the photos significantly differently after interacting with the person one month later (Gunaydin et al., 2017). These short- to medium-term perceptions of cross-functional teams and the manager's influence on them are therefore examined in the following chapters.

The following hypothesis derivations in the next Chapters are based on the results shown in Figure 3 with the classified factors "Self-perception, Leadership and Climate" from the Relationship dimension. Chapter 3.5.1 addresses the research question with the topics self-perception and leadership. The focus is on the influence of these factors on competition and on knowledge hiding. Chapter 3.5.2 focuses on hypothesis derivation based on the perception of the team-climate. The classified factor “climate” is addressed, more specifically the perception of the individual towards the team (climate). Chapter 3.5.3 takes up the topic of leadership in more detail and derives

hypotheses that provide further insight into the extent to which leadership can influence knowledge hiding.

3.5.1 Self-perception and perception towards the supervisor

RQ2: To what extent do self-perception and supervisor perception influence knowledge hiding in cross-functional teams?

To discuss the origins of intentional knowledge withholding, the term knowledge hiding must be defined. The term is described as "an intentional attempt by an individual to hide knowledge that has been requested by another person" (Connelly et al., 2012). As a direct remedy, rewards, organizational support, and other collaborative actions are positively associated with knowledge sharing (Serenko & Bontis, 2016). The following Chapter highlight the various characteristics of knowledge hiding to illuminate the emerging levels of knowledge hiding.

In this context, three different subcategories can be defined: (i) evasive hiding, (ii) playing dumb, and (iii) rationalized hiding (Connelly et al., 2012). These subcategories are characterized by an increasing hiding of knowledge and a potentially hostile attitude toward colleagues, superiors, and others.

First, "evasive hiding" describes the concept of promising to help but never intending to give information other than what the person wanted. In this process, information is given on the surface, but only to the extent that the person asking for the information makes direct contact. In addition, only the requested information is shared, while pending information is intentionally withheld.

At a second level, "playing dumb" goes as far as developing a bias against others by denying facts, expertise, and other important information by claiming ignorance. This attitude leads to either delayed progress due to the lack of knowledge of other team members or the outright omission of insights that are critical to the performance of the entire team (Connelly et al., 2012).

Finally, “rationalized hiding” is characterized by the smallest proportion of deceitful intentions: It can involve claiming one's inability to provide knowledge so as blaming other parties due to their apparent failure (Connelly et al., 2012).

At all of these levels of knowledge hiding, the degree of narcissism or hostility toward others in a knowledgeable individual determines the actual behavior of that individual, allowing knowledge hiding to change dynamically in response to changing leadership environments (Boz Semerci, 2019). These factors have a profound impact on the climate within the team, and in essence, the performance of multiple individuals is grouped together to solve a common problem.

Therefore, it is necessary to assess the extent of the climate, which generally refers to competition on the one hand and cooperation on the other. In traditional teams, these two sides seem to be mutually exclusive, as individual parties either band together and overcome difficulties or resort to hostile actions, resulting in projects stalling or being abandoned altogether. Cross-functional teams, however, serve a different purpose. They intend to group individual experts and decision-makers into working groups without direct support from their team, whose mission and objectives are limited to strict deadlines - all without prior contact or exchange. Further mutual support is not considered, as these individuals are usually confronted with different strategic, organizational and managerial mindsets, requests and regulations, and sometimes even involve external members, namely suppliers or customers. This leads to different department heads competing and collaborating at the same time, as different disciplines, responsibilities, and reporting bodies hinder consensus building, but still provide higher efficiency than traditional team settings (Ambrose et al., 2018).

This interaction between cooperation and competition leads to coopetition, which describes the coopetitive environment in cross-functional teams. It is created by the balance of power between the need to cooperate to achieve certain goals and the balancing (or rather competing) of targets of a financial or performance nature, both set by one's department or supervisor. Careful alignment of coopetition is critical to the success rate of cross-functional teams because it directly influences the dynamics of interpersonal behavior and thus the willingness to share knowledge. Personal goals such as maximizing personal benefits directly collide with the concept of teamwork, as members of such a team must achieve a collective goal and mission as well as collective values in order to be successful (Chen et al., 2006; Tjosvold et al., 2004). Due to the increasing complexity of modern, ever-changing business situations, the concept of individual one-to-one solutions is becoming increasingly rare. The need to assess the individual competitiveness of team members of cross-functional teams is critical, as factors that reinforce this mindset can lead to the above-mentioned different methods of knowledge hiding, thereby affecting the efficiency of the entire organization.

In the following, the dissertation focuses on the following types of competitive conditions that lead to increased individual competitiveness: Individual competitiveness as a personal attitude, competitive supervisor influence and antagonism as a closely linked personality trait.

Prior to the analysis, it is important to note that companies tend to assign coordination tasks that deal with simultaneous managerial, legal, and financial contradictions to the upper levels of the hierarchy (Ambos et al., 2008; Andriopoulos & Lewis, 2010), as these positions usually have both higher knowledge qualifications and leadership skills in terms of managing from a top-down

perspective. Among these conflicting tasks is the division between cooperation and competition, also called coopetition capability. Building an organizational structure centered on employees with high coopetition capability can reduce tensions within cross-functional teams if they are coordinated and led by a higher hierarchy (Bengtsson et al., 2016). Because these key hierarchical positions have both a direct connection to their subordinates through (in)formal communication channels and insight into the big picture of management, they can effectively reduce competition within cross-functional teams by allocating the necessary resources to each individual (Eisenhardt et al., 2010; He & Wong, 2004).

In this dissertation, it is assumed that competition within a team is the main driver of conflict and thus leads to knowledge obfuscation. Therefore, the following hypothesis is put forward:

Hypothesis 1 (H1). *Individuals who have a high competitive drive tend to hide knowledge.*

To further decipher the cause and measurement of competition, this dissertation dives into the various concepts of individual personality assessment. Both the environment and the personality of the individuals themselves can be considered as causal factors for the competitive behavior of team members. In the field of personality research, there are a variety of models for analyzing an individual's character, but the core analysis is similar. The individual's personality is assessed using the five main dimensions of extraversion, conscientiousness, neuroticism, agreeableness, and openness; this is considered the standard universal model of personality research. The main difference lies in the structures, as the HEXACO model additionally captures honesty, modesty, and emotionality, while the NEO PI-R has six subcategories for each main dimension in addition to the five main dimensions (Costa & McCrae, 2008).

Some models, such as the one presented in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), place additional emphasis on the development and establishment of maladaptive personalities, even going so far as to identify personality disorders dimensionally. The model integrates a personality inventory, called the PID-5, which includes findings on the dimensions of negative affectivity, detachment, disinhibition, psychoticism, and antagonism (Thimm et al., 2016). The basis of this personality dimension is also the assumption of a continuum between healthy and pathological. Negative affectivity is characterized by direct action-reaction effects and involves the experience of negative emotions (Watson & Clark, 1984). These include anger, contempt, nervousness or fear. The emotions may be temporary, but they shape future interactions between individuals. Individuals in this stage are either unable to connect with others on an emotional level or they avoid certain situations that may trigger anxiety, leading them to

potentially disengage from or further avoid other emotional connections. Disinhibition can be described as a lack of restraint that manifests in a disregard for social conventions, impulsivity, and poor risk assessment (Joyner et al., 2021). Detachment can be understood as a contrary trait to Extraversion and thus describes the avoidance of social situations and the withdrawal from intimate relationships. It should be noted that it is also supposed that a further correlation with Neuroticism exists, which also indicates that the factor structure is not completely distinct. Along with this, it correlates positively with motives associated with separation from others such as independence, but negatively with motives associated with closeness (Zeigler-Hill & Hobbs, 2017). However, beside the maladaptive component, it can also have a protective function, especially in environments where a high degree of deception is to be expected (Wissing & Reinhard, 2017). Another domain is psychoticism (consisting of the facets: Unusual Beliefs and Experiences, Eccentricity, Perceptual Dysregulation), whose Classification compared to the Big Five model is still widely debated. It is assumed that there is a relationship with the factor openness to experience & intellect. Nevertheless, it should be taken into account that this assumption can not always be verified (Zimmermann et al., 2014). While psychoticism is characterized by experiences that tend to be considered rather odd in the specific cultural context, a negative correlation with school performance can also be observed (Ciorbea & Pasarica, 2013). In addition, psychoticism is considered as a predictor for suffering from severe psychological stress, as it has been shown for instance in a sample of police officers (Kaur et al., 2013). The characteristics of psychoticism include aggressiveness, insensitivity, egocentricity, impulsiveness, creativity and asociality. Direct contact between people has completely ceased, and chaos among co-workers is the rule rather than the exception. Successful, sensible teamwork no longer exists at this stage, and primal attributes such as "might makes right" become dominant. The high turnover of employees and the constant interventions of superiors lead to a chain reaction that does not allow a quick return to the status quo.

Antagonism (consisting of the facets: Manipulativeness, Deceitfulness, Grandiosity) can be understood as the corresponding opposite to Agreeableness. While people with high levels of Agreeableness are likely to give priority to interpersonal harmony, antagonistic people are more likely to sacrifice their interpersonal relationships in order to achieve other goals. In addition, high correlations have been demonstrated between antagonism and antisocial behavior, any type of aggression, narcissism, and psychopathy. Studies have shown that certain maladaptive personalities are also steered in a political direction. Psychoticism is closely related to conservative positions on punishment, religion, and sexuality, while social desirability is related to liberal positions on the same attitudes (Verhulst et al., 2010). Related to this, it can also be noted that

antagonism accounts for a major part of the variance within the Dark Triad, as it is considered a central component of all three factors (Lynam & Miller, 2019). Looking at current research, all these traits, especially antagonism, are on a scale; all previous studies assure that this personality trait can be captured by items in a stable and independent manner. Antagonistic individuals are critical to assessing competition in cross-functional teams because they tend to compete rather than cooperate (Costa & McCrae, 2008). These so-called dark personality traits include traits such as manipulativeness, cunning, narcissism, and callousness (Widiger & Oltmanns, 2019), which correlate positively with career success (Spurk et al., 2016). Egocentric behavior dominated by narcissism and callousness significantly leads to higher salaries (Spurk et al., 2016; Sutin et al., 2009), while manipulative behavior leads to better internal networking (Dugan et al., 2019).

However, at the corporate level, no decision is made alone. At the level of the individual's environment, the bottom-up view, i.e., the individual's supervisor, has a major influence on the individual's behavior and performance. Regardless of the individual's position, the supervisor's leadership skills are critical to the performance of subordinates. Misperceptions about the right degree of external responsibility and delegation by superiors lead directly to dissatisfaction and thus to hostility toward upper management. A lack of recognition and an unclear organizational or authority relationship disrupt employees' work processes in the long term.

Leadership also has a clear impact on collaboration in cross-functional teams, either by promoting harmony among members or by destabilizing it. Evidence from current research suggests that considerate and participative leadership in particular has a positive effect on coopetition, while centralized decision-making power outweighs participative coopetition ability to some degree, inhibiting team decision-making and communication (Strese et al., 2016a; Tsai, 2002). This directly leads to an impediment to knowledge sharing, which in turn reduces the ability to collaborate.

Other studies examined the adjustment of individuals to the role of supervisor. In addition to the organizational and leadership responsibilities discussed, supervisors also fulfill a moral responsibility to be an appropriate role model in their organization. Individuals orient their behavior very specifically to both the example of their own supervisor and the behavior of business or corporate management. This method and the limits of this orientation are, of course, developed individually. The behavior of managers is copied and adapted downwards in every (corporate) system, i. e. depending on the individual orientation, every single employee shows similar behavior - sometimes less, sometimes more. According to the research, a leader's competitive

behavior would also cause their team members to behave accordingly. This leads to the following hypothesis regarding antagonism and competitive supervisor:

Hypothesis 2 (H2). *Individually competitiveness is increased by antagonism and competitive supervisor*

From the two hypotheses derived, the conceptual model is shown in Figure 4. It illustrates the first part of the study to investigate self-perception through the survey of antagonism, the perception of the supervisor as well as the individual competitiveness on knowledge hiding.

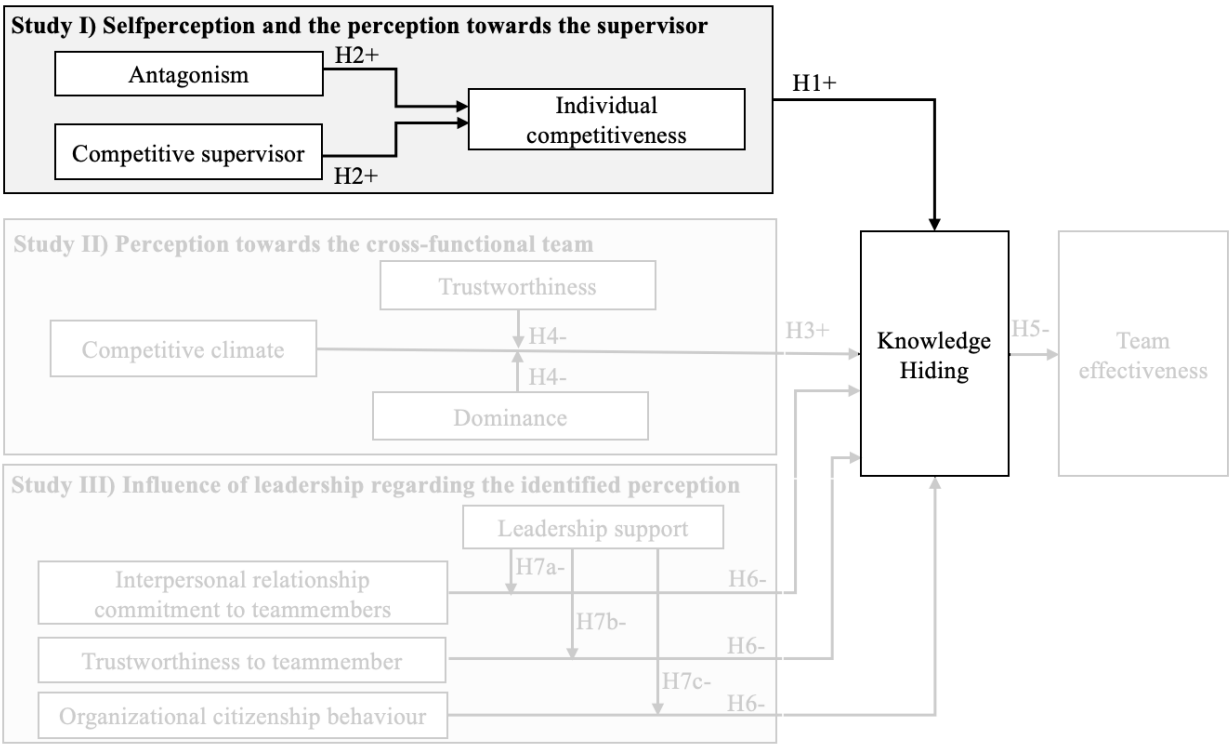


Figure 4 Conceptual model of the study I)

Source: author's illustration

3.5.2 The perception of cross-functional team members

RQ3: To what extent does the individual's perception of the cross-functional team influence knowledge hiding?

Competition can lead to an unwillingness to share tangible and intangible resources within the team (Ghobadi & D'Ambra, 2012a; Swab & Johnson, 2019). In many cases, this inevitably leads to unethical behavior in the individual.

This can take many forms, such as sabotaging colleagues to look better or withholding knowledge (Naidoo & Sutherland, 2016). Previous research has shown that knowledge withholding plays a particular role in competitive teams. In teams with a competitive psychological climate, conflicts often arise at the task and relationship levels. Task conflicts involve differing viewpoints and ideas related to the work itself, while relationship conflicts involve interpersonal tensions, frictions, and resentments (O'Neill et al., 2013). In addition to dysfunctional consequences for team members, such as declining member satisfaction (Amason & Sapienza, 1997; Jehn, 1995) decrease in creativity (Farh et al., 2010), innovation (O'Neill et al., 2013) and cohesion and effectiveness (Tekleab et al., 2009) the declining team performance also leads (Jehn & Mannix, 2001) to the hiding of knowledge.

The relationships of competitive psychological climate and knowledge hiding have been attempted to be empirically validated by various researchers. Predominantly, positive correlations have been found. Research by other authors such as Boz Semerci (2019) found that task conflict and relationship conflict have an additive effect on knowledge hiding behavior, but that no mediating role of perceived competition and knowledge hiding existed.

Therefore, the following hypothesis is made:

Hypothesis 3 (H3): *High competitive psychological climate increases the expression of knowledge hiding.*

Dominance is a trait that, from previous research, tends to have a negative impact on teamwork. Although dominance is primarily seen as a trait associated with higher power imbalance (Gough et al., 1951), it leads to higher career success and correlates with perceptions of higher competence (Chen et al., 2014). Dominance affects team management, adaptability, performance monitoring, and coordination. Dominant team members who view interaction along superiority and inferiority dimensions are likely to have a different perspective on team tasks and relationships than other team members (Driskell et al., 2006). This difference in situational awareness is more likely to create fractious climates between team members. Dominant individuals also have a tendency to build less positive interpersonal relationships (Driskell et al., 1993), give less attention to task input from other team members when making decisions (Driskell & Salas, 1992) and exhibit more ineffective communication behavior (Yukl & Falbe, 1990). Team members who are dominant and controlling may be less flexible but may be more inclined to monitor or control the behavior of other team members. Also, dominant team members want their needs to be placed higher and

enforced, making other team members feel misunderstood. Thus, high dominance is predicted to have a negative impact on shared situational awareness, interpersonal relationships (Graham et al., 2019) communication, and decision-making.

In addition to dominance, trust is considered to play a central role in an individual's initial perception (Oosterhof & Todorov, 2008). Trust has been shown to reduce uncertainty (Kollock, 1994; McEvily et al., 2003) and helps to solve problems (Jones, 1995; Singh & Sirdeshmukh, 2000) and improves collaboration within and between organizations (Das & Teng, 1998; Jones & George, 1998; Meier et al., 2016; Smith et al., 1995). Therefore, there has been a long-standing interest in trust in business management research.

Lack of trustworthiness between individuals, on the other hand, can seriously limit the sharing of important knowledge, which can affect the efficiency of teamwork. The correlation between trustworthiness and knowledge sharing has attracted much interest in academia. Researchers have attempted to confirm the correlations and relationships of trust on knowledge sharing behavior. Some have found positive correlations between trustworthiness and knowledge sharing (e. g. Hau et al., 2013; Holste & Fields, 2010; Mohammed Fathi et al., 2011; Sankowska, 2013). In turn, there were other authors that found no correlations (Chow & Chan, 2008; Li, 2005). Some articles revealed a relationship only for affect-based trust and knowledge (Bakker et al., 2006; Ko, 2010; Yang & Farn, 2009). The studies by Dhanaraj et al. (2004), Yang and Farn (2009) showed a positive relationship between tacit knowledge and trustworthiness. Overall, the recent research shows that trustworthiness is positively related to knowledge sharing. However, no publications were found that explicitly addressed trust in a competitive environment.

Therefore, the following hypothesis is formulated:

Hypothesis 4 (H4). *Trustworthiness and dominance have a decreasing moderating effect between competitive climate and knowledge hiding.*

Hypotheses 3 and 4 result in the second part of the study to investigate the perceptions of the cross-functional team. The conceptual model shows the moderating influences of dominance and trustworthiness in Figure 5.

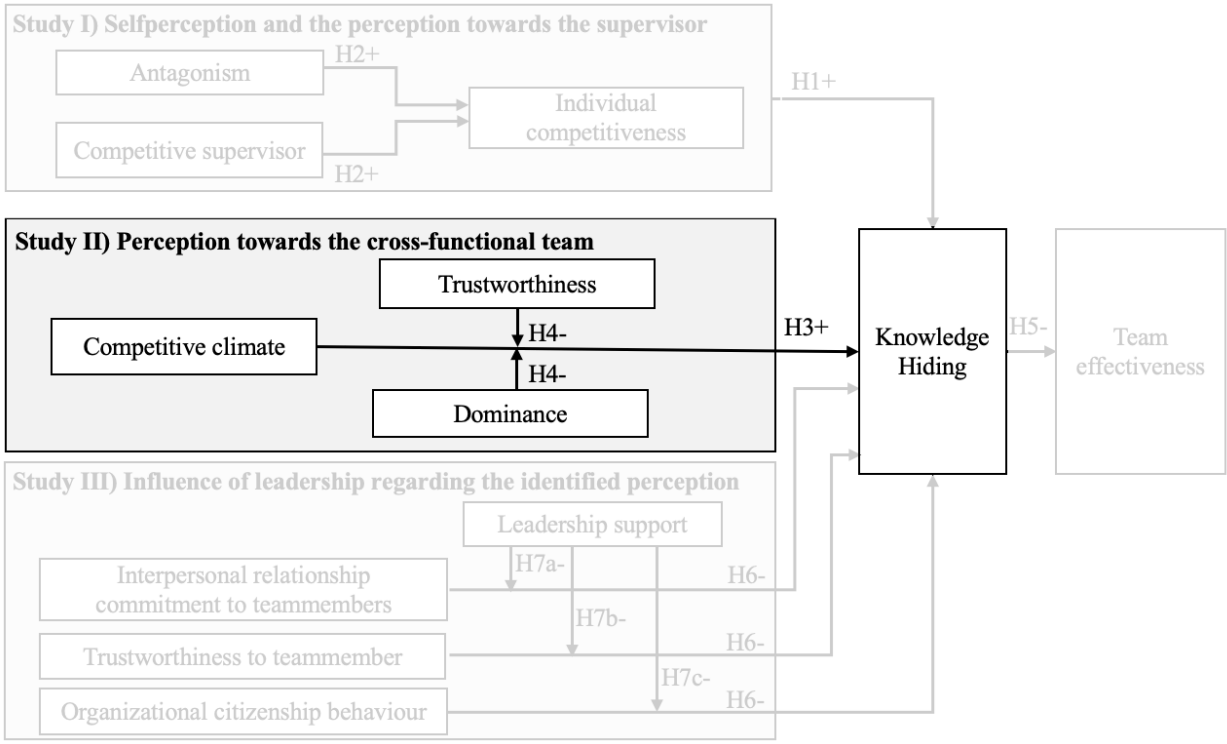


Figure 5 Conceptual model of the study II)

Source: author's illustration

3.5.3 The influence of supportive leadership on knowledge hiding

RQ4: How can leadership influence the perceptions of cross-functional teams to prevent knowledge from being hidden?

Especially in times of crisis, supportive leadership has been shown to help organizations through those. Supportive leadership works directly with employees and can increase personal factors such as engagement (Meierhans et al., 2008) reduce stress (Khalid et al., 2012) and negative emotions in employees after failure (Patzelt et al., 2021). Supportive leadership inspires, encourages, and motivates employees to work together and drive organizational profitability and development. In previous literature, there are several approaches to how leadership can influence knowledge sharing among employees. Leaders can increase team members' willingness to rely on information and increase team knowledge sharing by building team expertise (Lee et al., 2010). Bradshaw et al. (2015) examined the most effective leadership styles for increasing knowledge transfer. They examined transformational leadership, a behaviour, in which performance is to be enhanced by transforming the values of team members. Transformational leaders seek to intrinsically motivate their employees by, for example, communicating attractive visions, communicating the common

path to achieving goals, and supporting employees' individual development. Bradshaw et al. (2015) concluded that the transformational leadership approach correlated positively with knowledge transfer. These findings are also confirmed by other studies (Keller, 1992; Nguyen et al., 2022; Yammarino et al., 1993). On the other hand, there are few studies on knowledge hiding. For example, Nguyen et al. (2022) identified transformational leadership as a moderating aspect to reduce knowledge decline. Transformational leadership leads to a reduction in role conflict.

Other similar leadership concepts have also been examined in this light, such as ethical leadership. Ethical Leaders are individuals who behave morally even in their daily lives as leaders and in their immediate environment. Ethical leaders treat team members respectfully, do not lie to them, and do not favor one over another. According to Abdullah et al. (2019) ethical leadership of supervisors was negatively related to knowledge hiding and both were directly controlled by relational social capital. In this context, ethical leadership plays a crucial role. The findings of Koay and Lim (2022) suggest that moral disengagement mediates the correlation between ethical leadership and knowledge hiding. Organizational commitment moderates the correlation between ethical leadership and knowledge hiding, such that the relationship is more negative at higher commitment (Koay & Lim, 2022). Similar results show that this relationship is also moderated by psychological safety (Men et al., 2020).

Despite the above benefits, little research has been conducted on how supportive leadership affects knowledge hiding when circumstances change, such as during a pandemic. A recent study showed that, particularly during a pandemic, individuals' self-perceptions and perceptions of leadership can increase competition among cross-functional teams and lead to knowledge hiding (Ton et al., 2022b). To current knowledge, moderating effects such as individual perceptions of other team members, personality, and trust on the effects of knowledge-hiding behaviour and supportive leadership have not yet been examined.

This study builds on previous findings and recent data showing that antecedents such as individual self-perceptions and team member perceptions have an impact on knowledge hiding, and to this end, examines the moderating influence of supportive leadership.

The findings of this study should have theoretical and practical implications for research on crisis management, leadership, resource retention (Bass, 1995; Hobfoll, 1989) and knowledge hiding (Connelly et al., 2012) in the reducing of employee work performance (Saundry et al., 2021).

3.5.3.1 The relationship between knowledge hiding and team effectiveness

Team effectiveness can be defined in different dimensions. According to a study by Delgado Piña et al. (2008) team effectiveness is divided into the dimensions of performance, attitudinal outcomes, and behavioral outcomes.

While attitudinal and behavioral outcomes reflect individual self-perceptions and subjective perceptions of management, such as satisfaction (Campion et al., 1993; Doolen et al., 2003), commitment to the organization, trust and confidence (Campion et al., 1993, 1996; Doolen et al., 2003), absenteeism and safety (Cohen et al., 1996; Cohen & Ledford, 1994), performance refers to the objective evaluation of the organization or team. To assess team effectiveness, this study uses the third class, performance, which refers to employee behaviors that contribute to organizational effectiveness (Singh, 2021).

There are many reasons for the impact of knowledge hiding on team performance. First, knowledge hiding reduces the availability of knowledge to enable better performance (Xiao & Cooke, 2019). Employees who already hide knowledge tend not to seek support themselves because they themselves fear that others will hide their knowledge (Xiao & Cooke, 2019). This process leads to an increase in knowledge hiding and a decrease in performance within the team. Further studies show that competitions within the team increase when knowledge is at stake as a resource and knowledge is withheld accordingly (Ton et al., 2022).

According to researchers such as Ton and Hammerl (2021) knowledge hiding often hinders knowledge transfer within and between teams. This knowledge transfer process often aims to enhance employees' existing knowledge and optimize work performance through learning and combining knowledge (Wuryanti & Setiawan, 2017). In this context, Ton and Hammerl (2021) showed that the conditions for improving performance through knowledge transfer do not necessarily have to be time-intensive.

On the other hand, hiding knowledge often leads to a decrease in employee work performance, for example, because of a decrease in decision-making and problem-solving ability (Davenport et al., 2016). This leads to a spiral, as hiding knowledge prevents other colleagues from developing knowledge themselves, which results in knowledge being lost within the organization (Foss et al., 2015; Lee, 2016). In addition, employees may reduce documenting knowledge for job advantages, causing knowledge to be lost within the organization and decreasing the effectiveness of the team. Accordingly, the following hypothesis is proposed:

***Hypothesis 5 (H5)**: Knowledge hiding among employees in cross-functional teams decreases team effectiveness.*

3.5.3.2 Trust in cross-functional teams and knowledge hiding

The environment also has a direct impact on employees' knowledge sharing behavior, especially in threatening environments where employees are suspected of being stigmatized or discriminated against because of their knowledge (Jahanzeb et al., 2019). This often leads them to hide their knowledge to avoid criticism or harassment from colleagues (Arain et al., 2020; Riaz et al., 2019; Zhao et al., 2016).

Lanke (2018) found that knowledge hiding by employees increases when interpersonal interactions are met with a lack of dignity and respect. Therefore, the relationship and atmosphere between employees is particularly important as it has a profound impact on collaboration and thus tacit knowledge sharing (Casimir et al., 2012).

A good relationship between employees that includes respect, regular interactions, and trust can foster collaborative behavior among employees. Creating this kind of relationship is challenging, especially in cross-functional teams where employees have often never worked together before. Previous studies have shown that a competitive climate, on the other hand, promotes knowledge hiding (Han et al., 2020; Hernaus et al., 2019).

3.5.3.3 Interpersonal relationship commitment and knowledge hiding

It is known from several studies that the relationship between employees has an impact on knowledge hiding or sharing. Boz Semerci (2019) studied the influence of task conflict and relationship conflict and found that both have a positive influence on knowledge hiding; moreover, task conflict leads to greater competition.

When team members feel connected to each other, the positive effects of teamwork are enhanced. Relevant studies show positive correlations between engagement and performance, motivation, and job attendance; negative correlations exist between engagement and stress, intention to leave, and actually leaving the company (Cooper-Hakim & Viswesvaran, 2005; Delgado Piña et al., 2008). Therefore, it stands to reason that interpersonal relationship commitment (IRC) also entails other team-building effects.

3.5.3.4 Organizational citizenship behavior and knowledge hiding

In previous research, there are some studies that have examined the relationship between personality and behavior in relation to knowledge transfer and retention. In their study, Anand and Jain (2014) investigated examined a possible relationship between Big Five personality types and knowledge hiding. They found that extraversion, neuroticism, and agreeableness negatively influence knowledge hiding, while conscientiousness has a positive correlation. Similar results are also provided by Demirkasimoglu (2015). However, extraversion is positively correlated with playing dumb, while neuroticism has a negative correlation. Further empirical studies are needed (Anand & Jain, 2014).

More specifically, there are also within-team dynamics that affect knowledge hiding behaviors. Researchers have looked into multiple antecedents, such as knowledge-based ownership (Peng, 2013), organizational culture (Serenko & Bontis, 2016) and exclusion (Zhao et al., 2016).

More specifically, dynamics that affect knowledge hiding also exist. Researchers have examined several influential factors, such as knowledge-based psychological ownership (Peng, 2013), organizational culture (Serenko & Bontis, 2016) and exclusion (Zhao et al., 2016).

These are positive workplace behaviors that not only foster the aforementioned relationships among team members, but also promote organizational functioning. In previous literature, such behavior could be captured by the well-known Organizational Citizenship Behavior (OCB), which is characterized by the five factors of altruism, conscientiousness, sportsmanship, courtesy, and civic virtue (Organ, 1994). OCB is voluntary behavior in the workplace that has a positive impact on the functioning of the organization and is not explicitly considered within the formal incentive system (Organ, 1994). Altruism is defined as helping other organizational members, conscientiousness as performing one's duties, sportsmanship as dealing calmly with problems, civic virtue as participating in public life, and courtesy as consulting with colleagues before acting (Ocampo et al., 2018). These behavioral factors correlate with the Big Five personality traits, with Conscientiousness even appearing identically in both.

To date, there is no research on the aspect of the impact of OCB on knowledge hiding in cross-functional teams. Especially in cross-functional teams, workplace behaviors play a greater role because the previous characteristics of the employees in the team are not known. It is believed that the desired behaviors that lead to, among other things, organizational commitment (Gautam et al., 2005; Lavelle et al., 2009; Schappe, 1998), Job satisfaction (Chiu & Chen, 2005; Moorman, 1993; Schappe, 1998) and work autonomy (W. Liguori et al., 2013) also have a positive influence on knowledge transfer or a negative influence on knowledge obfuscation in cross-functional teams. Therefore, the following hypothesis was formulated:

Hypothesis 6 (H6): *Trustworthiness to team members, interpersonal relationship commitment and organizational citizenship behaviour decrease knowledge hiding.*

3.5.3.5 The moderating influence of leadership support

It is controversial whether leadership can influence behavior related to concealing or sharing knowledge. In particular, recent studies show that certain types of leadership promote knowledge sharing. In recent years, researchers have found that ethical leadership behaviors lead to knowledge sharing (Anser et al., 2021; Bavik et al., 2018; Bhatti et al., 2021; Koay & Lim, 2022). Transformational leadership behaviors also suggest an influence on knowledge hiding (Ladan et al., 2017). Kim and Park (2020) found that transformational leadership not only has a direct positive impact on knowledge sharing, but also on climate and organizational learning behaviors. In subsequent years, this leadership behavior has been further empirically studied. As a moderator, transformational leadership has a negative impact on the correlation between employee role conflict and knowledge hiding (Nguyen et al., 2022).

From the previous literature, it can be inferred that both ethical and transformational leadership lead directly and indirectly to knowledge sharing. Both types of leadership have similar values. Transformational leaders seek to intrinsically motivate their employees by, for example, communicating attractive visions, communicating the common path to goal achievement, acting as role models, and supporting employees' individual development.

Ethical leadership is viewed by its followers as an authentically moral person and leader who effectively impacts their associates (Treviño et al., 2000, 2003). Ethical leaders are individuals who exhibit moral characteristics and attitudes in their lives. Besides these personal characteristics, ethical leaders also perform ethical leadership by affecting their employees to develop an ethical consciousness and act morally. They accomplish this by using discipline, communication, and the impact of the leader (Brown & Treviño, 2006; Treviño et al., 2000). In both leadership behaviors, they challenge, motivate, and inspire their employees by maintaining high standards in mind that lead their performance (Bass et al., 2003). As a result, these supervisors gain the respect and recognition of their employees. Both leadership behaviors are characterized by supportive and reciprocal communication. Therefore, it is hypothesized that the supportive aspects of leadership act as a moderator on OCB interaction, trustworthiness and interpersonal commitment to team members, and knowledge hiding.

This leads to the following hypothesis:

***Hypothesis 7 (H7)**: Supportive leadership moderates the influence of a) interpersonal relationship commitment to team members, b) trustworthiness towards team members, and c) organizational citizenship behavior on knowledge hiding.*

The hypotheses 6 and 7 result in the model for determining the influence of supportive leadership on knowledge hiding and team effectiveness. Figure 6 illustrates the conceptual model for the third part of the overall model.

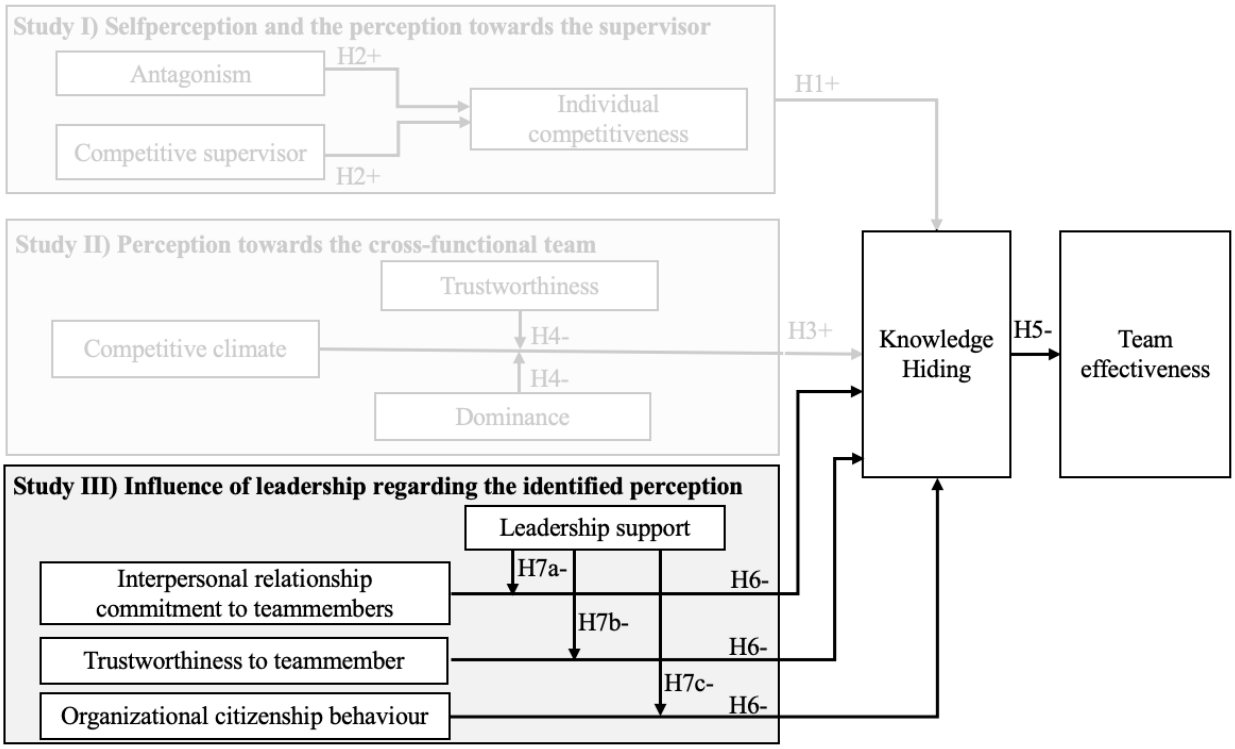


Figure 6 Conceptual model of the study III)

Source: author's illustration

Figure 7 illustrates the overall conceptual model and associated hypotheses to be tested in this dissertation. The three blocks show the quantitative studies that are the focus of the dissertation. Study I) focuses on self-perception and perception towards the supervisor. Study II) on the perception towards the team and study III) deals with the influence of the supervisor under different perceptions on knowledge hiding.

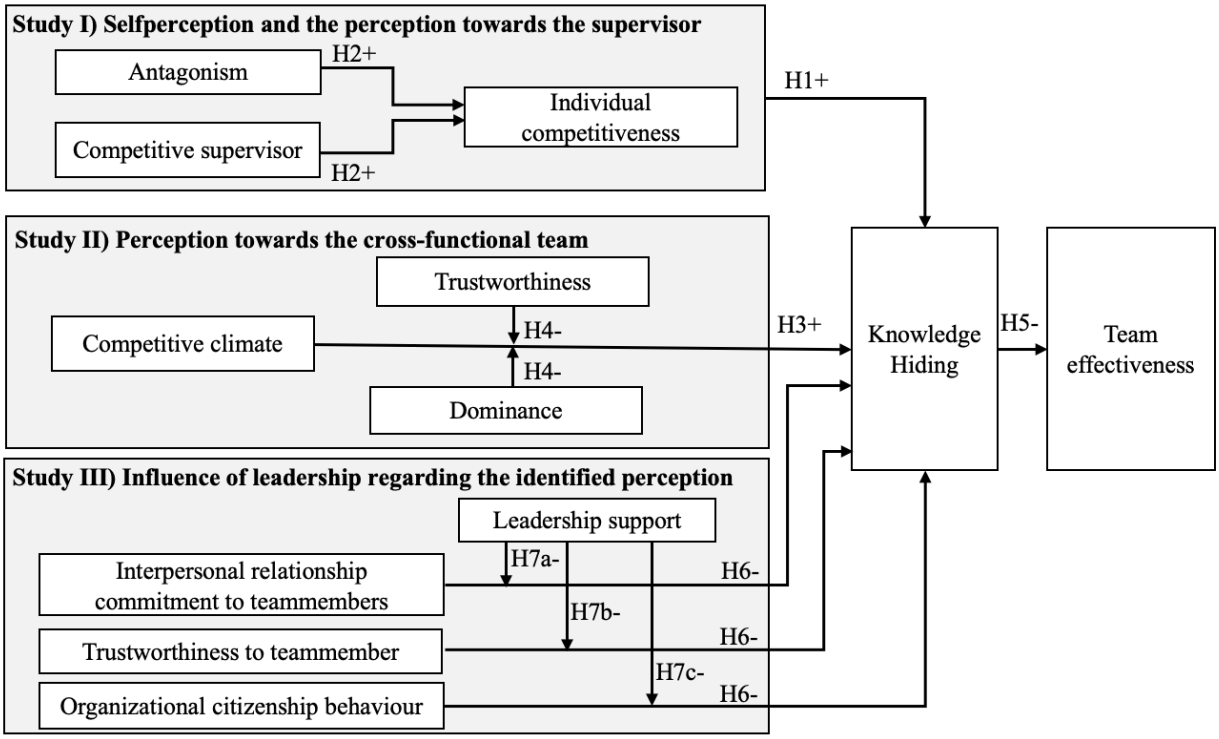


Figure 7 Conceptual overall model

Source: author's illustration

4 MATERIAL AND METHODS

4.1 Material

The studies use different scales to measure the variables that were described in detail in Chapter 3.5. For study I), the various influencing factors of individual competitiveness leading to knowledge hiding were measured, mainly involving antagonism and the behavior of a competitive supervisor toward increasing individual competitiveness. In study II), the influencing factor of competitive climate in cross-functional teams leading to knowledge hiding, moderated by the effects of perceptions of dominance and trust, was measured by applying different scales. For study III), the various scales leading the influencing factors of individual perception of knowledge hiding are mainly interpersonal relationship commitment for team members, trustworthiness for team members, and organizational citizenship behavior significantly. In addition, the moderating role of leadership support and the influence of knowledge hiding on team effectiveness are demonstrated.

First, a brief literature review was conducted defining the measurement factors that researchers have previously used in network-type contexts within organizations. The models were organized by changing the level of detail of the personality analysis according to the specific research phenomena, namely competition and cooperation between cross-functional teams (Ghobadi and D'Ambra 2012b). The scale of Brown et al. (1998) was used to measure supervisor competitiveness and a similar structure was used to formulate the items in the questionnaire. Brown et al. (1998) uses a four-item measure, which format was a seven-point Likert scale anchored by "strongly disagree" / "strongly agree.". The Coefficient alpha was 0.84. All four items were adopted for the study. Similar to the scale of Brown et al. (1998), the items were clustered as a dimension of psychological competitive climate at the level of self-set goals. This dimension is consistent with the research question of determining competitive supervisor and competitive climate.

Second, the items of the Personality Inventory for DSM-5 by Maples et al. (2015) were used to measure the personality traits of individuals. The factors predicting antagonism were further described, specifically the personality factors of attention seeking, callousness, deceitfulness, grandiosity and manipulativeness (Maples et al., 2015). Due to the length of the study and the associated dropout rate, the short form of the main actors under study recommended by Maples et al. (2015): Deception, grandiosity, and manipulativeness was used. The individual factors each consist of four items, which in turn consist of a 4-Likert scale with the ratings from "very false" to

"very true". These items are also verified by other researchers as explanatory variables for antagonism.

Third, the widely used scales of Connelly et al. (2012) were chosen to measure knowledge hiding. The construct of second-order knowledge hiding includes three latent constructs, namely evasive hiding, playing dumb, and rationalized hiding. Only the level of interpersonal behavior toward the organization was included (e.g., identification of effects on specific individuals and their resulting actions leading to knowledge mediating antagonisms, relationship with supervisor), while the concepts of organizational levels as a whole were intentionally left out. Organizational concepts in companies vary not only between industries themselves (product or service portfolio, customer demand and fluctuation, technological development, environmental and social regulations of legislators, and externalities such as pandemics), but also between units within the same organizational complex. These concepts may include visible or obvious sets of rules, but also hidden or missing factors of culture, ethics, and unspoken rules. Therefore, the including organization-dependent assumptions were refrained that might have biased the results, and a potential confounding factor in the questionnaire was eliminated.

Fourth, to measure perceptions of dominance, the article by Gough et al. (1951) was included. In the study, the items were developed in accordance with participants from different classes at the University of Minnesota. Due to the different environmental influences on students from the article by Gough et al. (1951) (particularly related to cross-functional teams), some items were dropped for this study. In summary, two of the 60 items from Gough et al. (1951) were selected and adapted for this study to measure dominance in the context of cross-functional teams.

Fifth, the items measuring trust (toward the cross-functional team member) were adopted from Cummings and Bromiley (1996). The author also developed items measuring trust based on the assumptions made in Chapter 3.5.3.2, as the unclear understanding of the concept of trust without a clarifying definition was considered a confounding factor for current and further research.

Sixth, a classic short questionnaire, called Organizational Commitment Questionnaire – OCQ, to measure commitment was used. To assess team members' interpersonal commitment, seven of the 15 items from the study by Mowday et al. (1979) were used and adapted for the survey of relationships in a cross-functional team. The seven items were selected on the basis of subjective ratings of fit to the facets of interpersonal commitment. Mowday et al. (1979) used a seven-point Likert scale with the scale point anchors “strongly disagree” to “strongly agree”.

Seventh, to measure leadership support, five of the eight items of the scale of Dai et al. (2013) were used to measure supportive leadership style. Since supportive leadership is characterized by trust, loyalty, and respect (Bass, 1995), five of the items of Dai et al. (2013) ideally suited to assess

perceptions of supportive leadership. Dai et al. (2013) used a Likert's five-point scale from one (strongly disagree) to five (strongly agree).

In eighth place, to measure OCB, the inventory of Chiang & Hsieh was (2012) was applied. The items predicting OCB were described in more detail, especially the trait factors altruism, conscientiousness, and sportsmanship, courtesy, and civic virtue. They were originally developed by Organ (1994). Other authors reached similar conclusions and rated the items in helping behavior (Van Dyne & LePine, 1998) or OCB-O and OCB-I (Williams & Anderson, 1991). These items are also verified as explanatory variables for OCB by other researchers.

Nineth, team effectiveness was also measured using Chiang & Hsieh's scale (2012). It was originally used for job performance in the tourism industry but is general enough that it could be adapted for cross-functional team effectiveness. The survey of Chiang & Hsieh (2012) used the seven-point Likert scale, ranging from one (strongly disagree) to seven (strongly agree) for each item.

To avoid confusion among participants due to different scales and labels of the poles, a standardized Likert scale was created for all items taken from the sources. All response options were measured on a bipolar, eleven-point rating scale ranging from zero (strongly disagree) to eleven (strongly agree). A 11-point Likert scale was chosen, as it provides more accuracy and reliability from a statistical point of view. Of course, only as far as the participants do not get confused in their answer due to the increased options. With a pre-test, assumptions about the sample were able to make in advance. Participants who already work in cross-functional teams are mostly academics in demanding positions and literally sound. With the high level of education, it was possible to increase the response options without an increased response bias. While a binominal or 3 point likert scale is often used for primary school students, 5 or 7 point likert scales are used for general opinion surveys, and the answer options can be increased for higher educated participants, since it can be assumed that the differentiation of the participants can be utilized.

4.2 Procedure

To empirically examine the conceptual model and test the hypotheses, a survey of cross-functional teams was conducted. Respondents were asked to complete a structured questionnaire with metric scales (see Appendix B - D).

The study was divided into three studies. This had the advantage of significantly shortening the survey duration to reduce the nonresponse rate. Especially with web surveys, the premature dropout rate is relatively high in contrast to other survey types (Čehovin et al., 2022). Therefore,

care was taken to ensure that the survey did not take longer than 10 minutes to complete in the pre-test. To further encourage participation in the survey, an additional monetary incentive of a lottery prize was offered. In each case, 3 x 20 EUR vouchers were raffled off and a donation of 0.10 EUR to Deutsche Kinderhilfe[1] was promised for each participation. The effectiveness of these incentives has been positively proven in various literatures (DeCamp & Manierre, 2016; Marcus et al., 2007). In addition, personal feedback regarding the personalities of the participant was given back after the survey, if possible. According to Marcus et al. (2007) offering personalized feedback compensates the negative correlation of low topic awareness on response rates.

Because the study used data based on self-report, another critical task was to consider and put into perspective the problem of common method bias (CMB). CMB refers to a bias in empirical measurement results that arises because survey respondents are simultaneously the source of both the exogenous and endogenous variable (Podsakoff & Organ, 1986). Thus, participants can often draw inferences about the underlying hypotheses from the questionnaire and adjust their response behavior accordingly.

First, CMB was avoided from the outset by considering the concepts of Podsakoff et al. (2003, 2012) when designing the questionnaire. Regarding the structure of the research instrument, the questions were clearly separated; the questions about the dependent constructs were asked before the questions about the independent constructs. Only one continuous rating scale was used throughout the questionnaire. In addition, the specific purpose of the studies was not disclosed to prevent bias in the results, and respondent confidentiality was maintained. Items were additionally rotated within the study to avoid primacy and recency effects (Deese & Kaufman, 1957) and order bias (Blankenship, 1942). There was no time limit for answering the questions. To validate the measurement, item loadings were checked. The items with low loadings and cross loadings were removed from the scale. The deleted items were reviewed and compared with the concept definition to ensure that these items did not significantly alter the scope of the construct.

The study included only two simple filter instructions. On the first page, the privacy policy had to be confirmed. The second page asked, in addition to demographic data, whether the participant had already worked in cross-functional teams. This question also had to be confirmed, otherwise the survey ended directly.

In terms of participants, the survey was conducted only in Central Europe. Moreover, it was published on SoSciSurvey.com in order to collect, pool and understand the data. All three surveys were published consecutively. The first survey ran from October 21 to November 24, 2021, the

[1] Deutsche Kinderhilfe is a non-profit registered association that supports projects for needy children and families throughout Germany.

second survey ran from January 13 to January 31, 2022, and the third survey ran from February 01 to April 25, 2022.

4.3 A priori calculation of the sample size

The specification of statistical power and its context for the evaluation of scientific studies has become a central aspect. Therefore, statistical power is also presented in this study. Depending on the values to be achieved by the model, such as the effect size, the alpha error or power and the number of predictors, the sample size can be determined a priori.

Researchers have been concerned with sample size determination for decades. Results have varied in multiple regression analysis over the years. For example, Nunnally (1978) suggested that the sample size in multiple regressions should not be smaller than 300. In contrast, Wampold and Freund (1987) concluded that the sample size can be smaller than the 10:1 ratio of predictors. Therefore, it can be assumed that the a priori calculation of the sample size for linear regressions can be set differently.

Hypothesis tests in the general linear model can generally be expressed by an F-ratio. The statistical significance becomes relevant when the null hypothesis is false. In this case, these test statistics follow a non-central F-ratio. The exact form of a non-central F-ratio not only depends on the degrees of freedom in the numerator and denominator, but also on a noncentrality parameter. The noncentrality parameter reflects the extent to which the null hypothesis is false and can be viewed as a multiplicative function of sample size and effect size. The statistical power of tests in multiple regression also depends on the noncentral F distribution, which has three parameters: Degrees of freedom in the numerator (u), degrees of freedom in the denominator (v), and non-centrality parameter (λ). The degrees of freedom in the numerator and denominator depend on the number of predictor variables variables (p), the sample size, and the type of effect being tested. Table 6 shows the input and output parameters for study II) and study III).

Table 6 Input and output data for the a priori estimation of the sample size

Input parameters	**Study II)**	**Study III)**
Effect size f^2	0.2	0.2
a err prob	0.05	0.05
Power (1- **β** err prob)	0.95	0.95
Number of predictors	7	9
Output parameters		

Parameters of non-centrality λ	23,4	25,4
Critical F	2,0947	1.9608
Counter df	7	9
Denominator df	109	117
Total sample size	117	127

Source: author's data

The goal is to achieve high statistical power, and 0.8 is often considered desirable in this regard (Marino, 2018). As Cohen's effect size f^2 , 0.2 is given as the limit for a small effect (Cohen, 2013). Therefore, this value is included in the calculation. The sample size was calculated using the GPower calculation tool. With an effect size of $f^2 = 0.2$ and a power of 0.95, 117 subjects would be needed for study II) with seven predictors and 127 subjects would be needed for study III) with 9 predictors to obtain a significant result with a dependent F-test ($\alpha = 0.05$).

When testing a hypothesis, an error of the 1st kind occurs if the null hypothesis is rejected although it is actually proven (based on false positives). In contrast to the error of the 1st kind, an error of the 2nd kind means that the test falsely confirms the null hypothesis although the alternative hypothesis is correct. The a priori calculation of both studies are shown graphically in Figure 8 with the values from Table 6, error 1st kind is shown in red, error 2nd kind in blue.

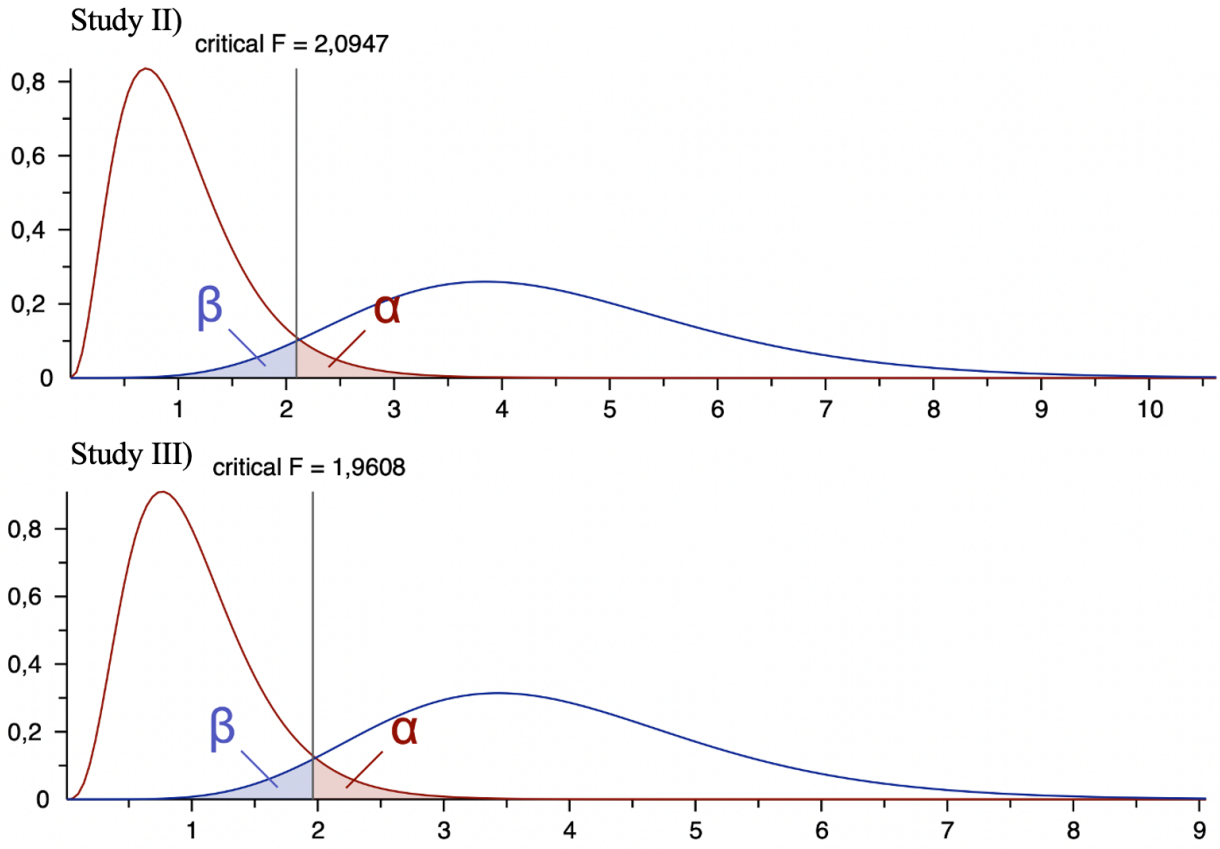


Figure 8 Representation of possible values of error probability 1. type and 2. type

Source: author's illustration

5 RESULTS AND DISCUSSIONS

5.1 Results

The sample for all three studies consisted of a heterogenous group. Although the studies were collected at different times, surprisingly, the distribution of demographic data is very similar across all three studies. The reason for this is assumed to be that the survey was published in SurveyCircle[2] for all three studies to reach the participants. The gender ratio indicated a high level of female participants. Additionally, many experts previously invested cross-functional teams highlight an academic background, with more than half of the relevant survey respondents having a Bachelor's degree or higher degrees. Lastly, it became evident, that lately, many young professionals joined the ranks of highly specialized experts in cross-functional teams, allowing the transformation towards a more agile and flexible approach in favor of cross-functional teams. The descriptive data is provided in Table 7.

Table 7 Overall descriptive data

Gender (proportional):				Age (proportional):				Highest education (proportional):			
Study	I)	II)	III)		I)	II)	III)		I)	II)	III)
Male	0.41	0.44	0.41	< 21	0.02	0.03	0.01	Secondary school	0.01	0.01	0
Female	0.59	0.56	0.59	21 - 30	0.76	0.72	0.72	High school	0.03	0.02	0.07
Other				31 - 40	0.14	0.18	0.21	Bachelor	0.18	0.37	0.25
				31 - 50	0.06	0.06	0.04	Master	0.56	0.42	0.49
				51- 60	0.01	0.01	0.01	PhD	0.17	0.16	0.17
				> 60	0.01	0	0.01	Other	0.05	0.02	0.01

$n_{Study\ I)}$= 131, $n_{Study\ II)}$= 119, $n_{Study\ III)}$=130
Source: author's data

5.1.1 Results of self-perception and perception towards the supervisor

Structural equation models (SEM for short) are used to test theory-based model assumptions of complex relationships. They are now a standard procedure in many different disciplines, which are used, for example, in social and psychological scientific fields. Therefore, the use of SEM is recommended to clarify the interrelationships of psychological self-perceptions and those vis-à-vis supervisors. In addition to testing model assumptions, SEM is also used in the field of test

[2] SurveyCircle.com is a website where students and researchers can publish their surveys to acquire participants.

construction to explain relationships between items. In general, structural equation models are a combination of factor and path analysis.

SEM in Stata 14.0 was applied to the results to test the assumed model. All analyses used a covariance matrix as input and maximum likelihood estimation. At the beginning of estimating a measurement model for the scales, paths were later added to the measurement model to test the hypothesized relationships.

In general, the proposed model was supported by the zero-order correlations. Antagonism was significantly correlated with individual competitiveness, knowledge hiding, and competitive supervisor ($r = 0.34$, $p < 0.01$; $r = 0.64$, $p < 0.01$; $r = 0.39$, $p < 0.01$). In addition, the correlation between competitive supervisor and individual competitiveness and knowledge hiding was significant ($r = 0.24$, $p < 0.05$; $r = 0.46$, $p < 0.01$). Knowledge hiding was positively correlated with individual competitiveness ($r = 0.19$, $p < 0.05$) (see Table 8).

Table 8 Means, standard deviations, intercorrelations of latent variables and Cronbach's alpha of study I)

	Variable	M	SD	1	2	3	4	Cronbach's α
1	Antagonism	3.82	2.22	1				0.95
2	Individual competitiveness	7.7	1.78	0.34**	1			0.78
3	Knowledge hiding	4.29	2.36	0.64**	0.19*	1		0.93
4	Competitive supervisor	5.2	2.54	0.39**	0.24**	0.46**	1	0.83

Notes: $n_{Study\ I)} = 131$ $^{**}p < 0.01$, $^{*}p < 0.05$; Source: (Ton et al., 2022b)

In the second step, the model fit was tested. Especially for theories about empirical (psychological) phenomena, e.g. personality tests, the procedure of model checking is relevant (Karimi & Meyer, 2014). In statistical model checking, empirically collected data are tested for harmonization with the model assumptions, i.e., model validity is tested in the population, since the empirical data are population estimates. It is also analyzed whether the collected data can sufficiently validate the model assumptions from a theory. In terms of the principle of falsification, it is important to be able to identify possible model deviations. Therefore, it is a prerequisite that structural equation models must be able to reliably evaluate the fit towards the empirical data with the hypothesized model.

The model goodness of fit examines the agreement of a population covariance matrix resulting from the hypothesized model with the estimated population covariance matrix. From popular literature, two types of model fit exist (McDonald & Ho, 2002; Yuan, 2005). On the one hand, it

is possible to calculate the exact model fit, i.e., a $\chi 2$ -test, and on the other hand, it is possible to perform an approximate model fit, i.e., the calculation of fit indices.

The $\chi 2$-test examines the suitability of a postulated structural equation model (Schermelleh-engel et al., 2003). The null hypothesis of the $\chi 2$-test is that the empirical data can represent the model sufficiently well. In contrast, the alternative hypothesis is that the empirical data do not fit the model, consequently that the model has not been specified correctly. Accordingly, a nonsignificant result is desired, since this supports the model assumptions. In general, the $\chi 2$ -test makes a comparison of the population covariance matrix with the covariance matrix implemented in the model. If the test result is insignificant, the null hypothesis is retained and it is concluded that the postulated model describes the observed data sufficiently well statistically. Some problems exist with counting only on model $\chi 2$ as a goodness-of-fit statistic. The $\chi 2$-test represents a very stringent procedure and may indicate very small model deviations for large samples. If the sample size is high, the $\chi 2$ value may cause the model to be dismissed even if the differences between observed and estimated variances are small (Kline, 2010), so the approximate model fit is often used.

Fit indices are generally of two types, firstly comparative or incremental fit indices and secondly absolute fit indices. Comparative or incremental fit indices determine the proportional improvement of the model fit compared to a restrictive null or independence model. A null model is a model in which all variables are assumed to be uncorrelated and thus set to zero. Consequently, only the variances of the observed variables are estimated. For the study, the comparative fit index (CFI) (Bentler, 1990), the root mean square error of approximation (RSMEA) with confidence intervals, and the standardized root mean square residual (SRMR) and the Tucker-Lewis index (TLI) (Bentler & Bonett, 1980) were used.

As described, the comparative fit index (CFI) matches the model to a model with no connecting paths between variables, so that the variables are independent of each other. It can vary between 0 and 1, with higher values suggesting a better fit. It takes into account sample size issues that are ignored with the $\chi 2$ of the model fit (Gatignon, 2010). One group of researchers suggests that values below 0.90 should be considered unacceptable (Marsh et al., 2004), while some authors suggest increasing the widely used criterion of 0.90 (Hu & Bentler, 1999).

The Root Mean Square Error of Approximation (RMSEA) is a variable of the fit in the population and thus refers to the gap due to the estimation. A score close to zero indicates better fit, higher values indicate worse fit. Values ≥ 0.10 indicate a for a poor fit, values between 0.08 and 0.10 indicate a moderate fit, and values ≤ 0.05 indicate a very good fit (MacCallum et al., 1996).

Standardized Root Mean Square Residual (SRMR) is a measure of the fit quality based on the fitted residuals. Higher values reflect poorer fit, so SRMR should be less than 0.05 to ensure favorable fit (Hu & Bentler, 1999), while scores less than 0.10 are generally considered reasonable (Kline, 2010).

The Tucker-Lewis index (TLI) solves some of the problems of negative bias (Tucker & Lewis, 1973). Values for the TLI should range from 0 to 1, with a cutoff value of 0.90 or higher indicating a good model fit (Bentler & Bonett, 1980).

In the first model, only the paths from the hypotheses were entered. The model did not converge, so it was terminated after 10 iterations. With two additional structural paths that had the largest covariances, the model subsequently converged. Using a third structural path, the fit indices for the model were good enough (see Table 9).

Table 9 Improving confirmatory factor analysis by adding structural paths

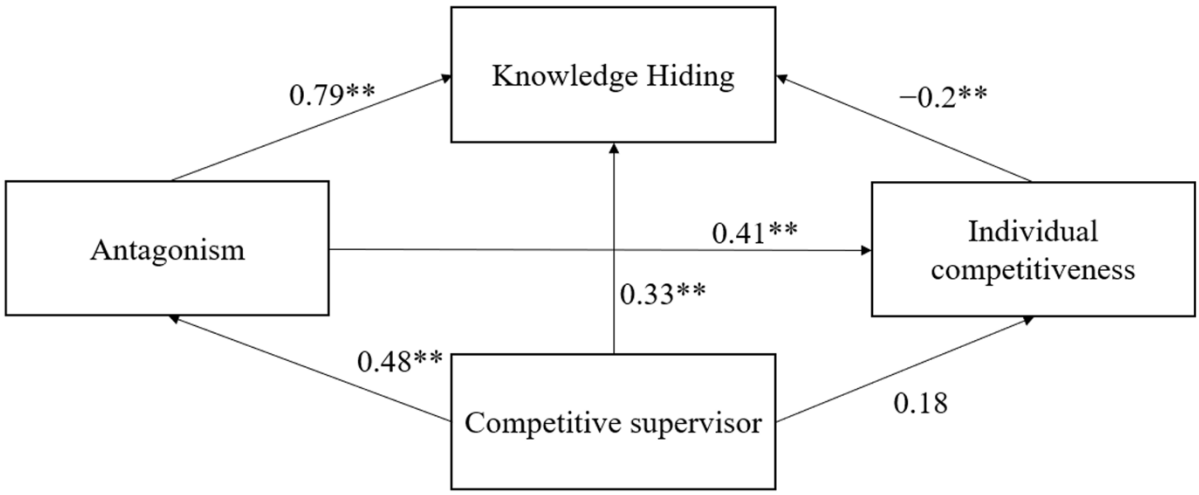
Model	Description	χ^2	CFI	WLI	SRMR	RMSEA
1	3 modification covariances added	114.17	0.94	0.92	0.06	0.08
2	2 modification covariances added	127.73	0.93	0.91	0.08	0.09
3*	1 modification covariance added	190.72	0.87	0.83	0.15	0.13
4*	Hypothetical model	210.17	0.85	0.81	0.19	0.14

*only 10 iterations, since no convergence; Source: (Ton et al., 2022b)

The model with three additional structural paths has an overall good fit ($\chi 2 = 114.17$, $p < 0.001$; CFI = 0.94, TLI = 0.92, RMSEA = 0.08, SRMR = 0.06). As shown in Figure 9, H1 is rejected because individuals with high competitiveness show lower expressions of knowledge hiding.

H2 is partially supported. Individuals with antagonistic personality traits show increased knowledge hiding, while the correlation of competitive supervisor and individual competitiveness is not significant.

As model fit was improved by structural paths, further significant correlations emerged within the model. An environment with a competitive supervisor leads to antagonism and knowledge hiding. Antagonism leads to knowledge hiding.



Notes: **p < 0.01

Figure 9 Standardized path loads

Source: (Ton et al., 2022b)

5.1.2 Results of perceptions toward cross-functional team members

Descriptive statistics for the main variables of interest to the study II) are presented in Table 10. Knowledge hiding was significantly correlated with competitive climate, trust, and dominance (r = 0.53, $p < 0.01$, r = -0.3, $p < 0.01$, r = 0.4, $p < 0.01$). In addition, the correlation between dominance and confidence was significant (r = -0.46, $p < 0.01$). Age was opposingly correlated with confidence (r = -0.24, $p < 0.05$). All latent variables knowledge hiding, competitive climate, trust and dominance have Cronbach's $\alpha > 0.8$ indicating high reliability.

Table 10 Means, standard deviations, intercorrelations of latent variables and Cronbach's alpha of study II)

	Variables	**M**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Cronbach's α**
1	Knowledge hiding	4.83	2.57	1							0.93
2	Competitive climate	5.59	2.88	0.53**	1						0.92
3	Trust	7.03	2.84	-0.3**	-0.11	1					0.87
4	Dominance	5.93	2.75	0.4**	0.17	-0.46**	1				0.81
5	Age		4.98	0.05	-0.11	-0.24*	0.13	1			-

6	Gender	1.57	0.51	-0.02	-0.05	-0.05	-0.01	-0.25	1	-
7	Education	3.79	0.88	0.16	-0.05	0.01	0.13	0.44	-0.14	1 -

Notes: $n_{Study\ II)}$= 119 ** $p < 0.01$, * $p < 0.05$. Source: author's data

Hypotheses were tested using a series of hierarchical linear regression analyses with Stata 14 (Table 11). All variables were standardized to mitigate multicollinearity. In addition, collinearity diagnostics showed that multicollinearity was not a significant problem (with tolerance indicators ranging from 0.66 to 0.93 and VIF values ranging from 1.07 to 1.51).

First, the control variables (namely: gender, age, and education) were included in Model 1, followed by the independent variables (competitive climate) and the moderator variables (trust and dominance) in Model 2. Model 3 includes the interactions (competitive climate x trust; competitive climate x dominance) related to the outcome variable, knowledge hiding. Across the models, R^2 increases and shows a steady improvement in exploration power, as seen in Table 11.

Table 11 Effects of competitive psychological climate on knowledge hiding

Variable	**Model 1 Beta**	**SE**	**Model 2 Beta**	**SE**	**Model 3 Beta**	**SE**	**Results**
Independent variable							
Competitive climate			0.37**	0.06	0.76**	0.23	H3 supported
Moderator variables							
Dominance			0.2**	0.07	0.09	0.14	
Trust			-0.12	0.07	0.25	0.13	
Interaction effects							
Competitive climate X Dominance					0.02	0.02	H4 partially supported
Competitive climate X Trust					-0.07**	0.02	
Control variables							
Age	-0.10	0.05	-0.01	0.04	-0.02	0.04	
Gender	0.02	0.43	0.02	0.36	-0.01	0.33	
Education	0.48	0.28	0.33	0.23	0.38	0.21	

Adj. R^2	< 0.01**	0.37**	0.48**
Δ Adj. R^2		0.37	0.11

Notes: *$p < 0.05$, **$p < 0.01$, $n_{Study\ II)} = 119$. Source: author's data

Model 2 shows that competitive climate leads to knowledge hiding (β =0.37, $p < 0.01$), supporting H3.

H4 predicts that there is a stronger relationship between competitive climate and knowledge hiding when the degree of dominance or trustworthiness is higher. This can be partially supported. The results in Model 3 suggest a positive interaction effect for dominance, but it is not significant, so the effect of dominance in H4 is not supported. Furthermore, the results show a consistent pattern of a opposing and significant relationship between competitive climate and knowledge hiding moderated by trust (β = -0.07, $p < 0.01$), which supports the effect of trust in H4.

The moderating effect of trust is shown in Figure 10. The simple slope analysis showed that the correlation between competitive climate and knowledge hiding becomes significantly weaker at high levels of trust.

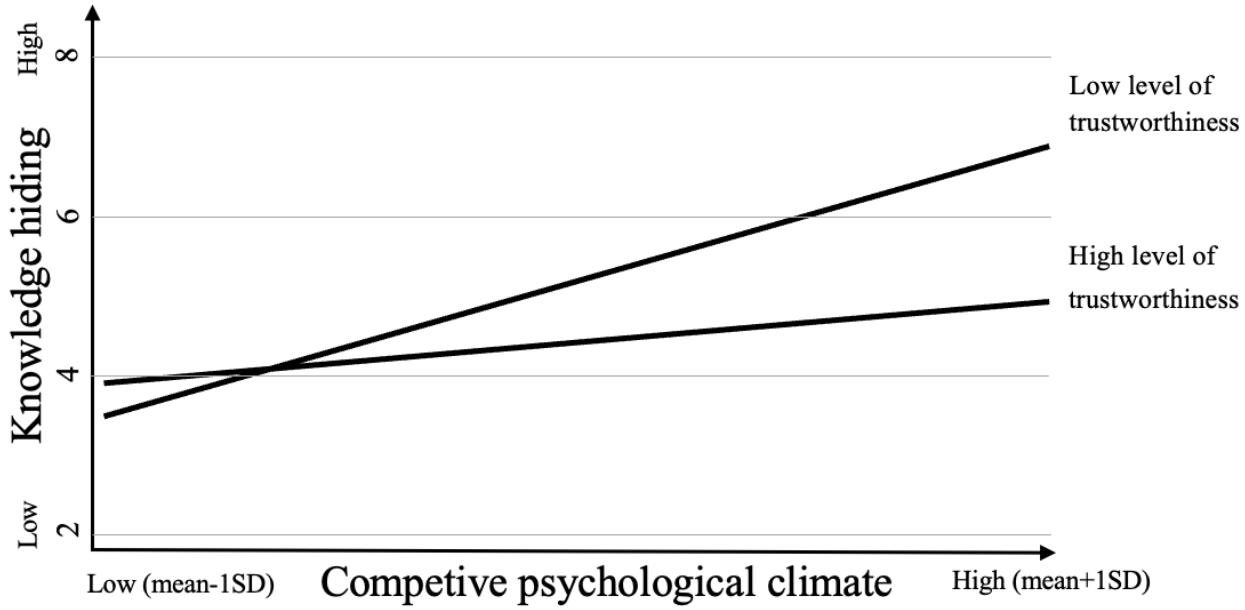


Figure 10 The moderating effect of trust in the competitive climate and the relationship between knowledge hiding

Source: author's representation

5.1.3 Results of the influence of supportive leadership on knowledge hiding

Descriptive statistics for the main variables of interest in the study III) are shown in Table 12. Knowledge hiding has inverse correlation with IRC (r = -0.3, $p < 0.01$), OCB (r = -0.56, $p < 0.01$), leadership support (r = -0.3, $p < 0.01$), trust (r = -0.47, $p < 0.01$), team effectiveness (r = -0.5, p <

0.01), gender (r = -0.3, $p < 0.05$), and equally directed correlation with age (r = 0.17, $p < 0.05$). IRC was significantly equally directed with OCB (r = 0.46, $p < 0.01$), leadership support (r = 0.35, p < 0.01), trust (r = 0.52, $p < 0.01$), and team effectiveness (r = 0.62, $p < 0.01$). There was also a correlation between OCB and leadership support (r = 0.43, $p < 0.01$), trust (r = 0.61, $p < 0.01$), and team effectiveness (r = 0.64, $p < 0.01$). Trust and team effectiveness correlated equally directed with leadership support (r = 0.39, $p < 0.01$; r = 0.37, $p < 0.01$), and trust and team effectiveness also correlated significantly in the equal direction (r = 0.71, $p < 0.01$). Age additionally correlated with education (r = 0.28, $p < 0.01$).

Table 12 Means, standard deviations, intercorrelations of latent variables and Cronbach's alpha

	Variables	**M**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**α**
1	IRC	6.42	2.28	1									0.94
2	OCB	7.13	1.66	0.46**	1								0.95
3	Knowledge Hiding	4.32	2.37	-0.3**	-0.56**	1							0.95
4	Leadership Support	6.61	2.44	0.35**	0.43**	-0.3**	1						0.89
5	Trust	6.64	1.93	0.52**	0.61**	-0.47**	0.39**	1					0.95
6	Team effectiveness	7.28	2.47	0.62**	0.64**	-0.5**	0.37**	0.71**	1				0.97
7	Age	8.96	5.34	-0.02	-0.2*	0.17*	-0.2*	-0.1	-0.11	1			-
8	Gender	1.6	0.5	0.05	0.16	-0.18*	0.13	0.12	0.15	-0.26	1		-
9	Education	3.84	0.91	0.12	0.01	-0.02	-0.06	0.08	-0.03	0.28**	0.13	1	-

Notes: $n_{Study\ III)} = 130$ ** $p < 0.01$, * $p < 0.05$. Source: author's data

Hypotheses were tested using a series of linear regression analyses with Stata 14 (Table 13). All variables were standardized to mitigate multicollinearity. In addition, collinearity diagnostics showed that multicollinearity was not a significant problem (with tolerance indicators ranging from 0.53 to 0.87 and VIF values ranging from 1.15 to 1.86).

Table 13 shows the results of the regression analysis for team effectiveness as a function of knowledge hiding. The overall model is significant (F = 43.79, $p < 0.01$). It explains a major part of the variance of the dependent variable (R^2 =0.2549). According to the regression analysis results, H5 can be confirmed: As knowledge hiding increases, team effectiveness decreases (r = -0.486, $p < 0.01$).

Table 13 Linear regression of knowledge hiding on team effectiveness

Source	**SS**	**df**	**MS**	Number of observations	=	130
				F(1, 3)	=	43.79
Model	186.527	1	186.527	Probability > F	<	0.01
Balance	545.217	128	4.259	R^2	=	0.2549
				Adj. R^2	=	0.2491
Total	731.744	129	5.672	Root MSE	=	2.0639
Team Effectiveness	**Coef**	**Std. Err.**	**T**	**P > t**	**95% Conf. interval**	
Knowledge hiding	-.486	0.073	-6.62	<0.01	-0.632	-0.341
_cons	7.869	0.565	13.93	<0.01	6.751	8.987

Notes: $n_{Study\ III)} = 130$. Source: author's data

With regard to H6 and H7, the control variables (namely: gender, age, and education) were included in Model 1, followed by the independent variables (OCB, IRC, and trust) and the moderator variable (leadership support) in Model 2. Model 3 includes the interactions (OCB X leadership support; IRC X leadership support; trust X leadership support) related to the outcome variable, knowledge hiding. Model 3 shows improvement and significance in exploration power, which can be seen in Table 14.

Table 14 Hierarchical linear regression of study III)

Variable	Model 1 β	SE	Model 2 β	SE	Model 3 β	SE	Results
Independent variable							
IRC			-0.003	0.09	-0.11	0.27	H6 partially supported
Trust			-0.25*	0.12	-0.18	0.29	
OCB			-0.57**	0.14	-1.04**	0.3	
Moderator variable							
Leadership support			-0.03	0.08	-0.82	0.33	
Interaction effects							
IRC X Leadership support					0.01	0.04	H7a rejected
Trust X Leadership support					-0.002	0.04	H7b rejected
OCB X Leadership support					0.1*	0.05	H7c supported
Control variable							
Age	0.06	0.04	0.03	0.03	0.02	0.04	
Gender	-0.62	0.43	-0.28	0.37	-0.34	0.2	
Education	-0.1	23	-0.11	0.2	-0.11	0.37	
R^2	0.05			0.31		0.33	
ΔR^2				0.26		0.02	

** $p < 0.01$, * $p < 0.05$. Source: author's data

H6 predicts that there is a relationship between IRC, Trust and OCB and knowledge hiding. The results in Model 2 suggest all three variables have a decreasing effect on knowledge hiding, but only trust and OCB were significantly, so H6 is only partially supported.

It shows that trust is decreasing knowledge hiding (β =-0.25, $p < 0.05$), supporting the effect of trust on knowledge hiding in H6. OCB decreases the expression of knowledge hiding, supporting the effect of OCB and knowledge hiding in H6 (β = -1.04, $p < 0.01$).

The results in Model 3 include the interaction effects of IRC, trust, and OCB with leadership support. The interaction effect of leadership support on IRC and knowledge hiding is amplifying but not significant, rejecting H7a. In addition, the interaction effects of leadership support on trust and knowledge hiding are very weakly correlated, but not significantly, rejecting H7b. The results show a consistent pattern of significant relationships between OCB and knowledge hiding moderated by leader support (β = 0.1, $p < 0.01$), supporting H7c. The moderating effect of OCB is shown in Figure 11.

The simple slope analysis indicated that the relationship between OCB and knowledge hiding weakens at high levels of leadership support. Knowledge hiding is more prevalent at low OCB (1-SD) and low leadership support than at higher leadership support. A slight reversal occurs at high OCB (1+SD). Knowledge hiding is slightly more common with high leadership support.

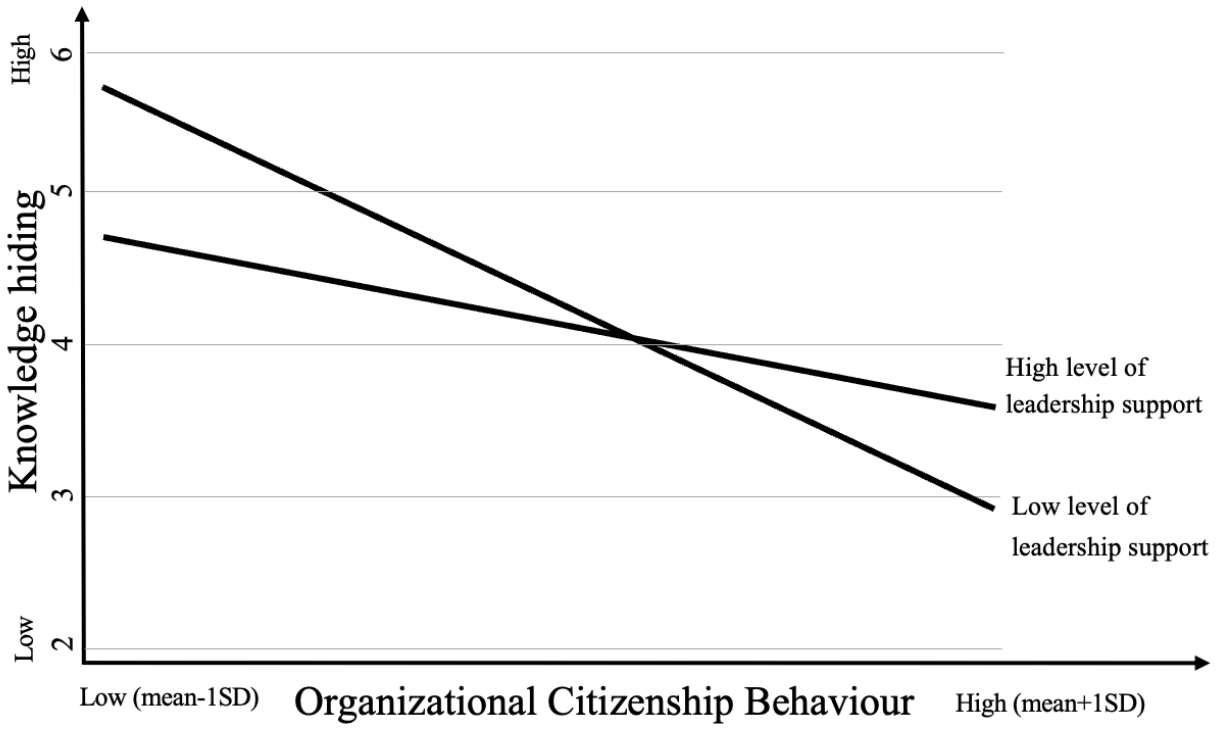


Figure 11 The moderating effect of Organizational Citizenship Behavior and knowledge hiding behavior

Source: author's representation

The three studies include a total of seven hypotheses, each examining different facets of individuals' perceptions of cross-functional teams. The first study examines hypotheses 1 and 2,

the second study examines hypotheses 3 - 5, and the final study examines hypotheses 6 and 7. Table 15 provides an overview of the hypotheses in the three studies. Of the total 7 hypotheses (hypothesis 7 consists of three sub-hypotheses), 3 hypotheses are confirmed, 3 hypotheses are partially confirmed, and the others were rejected, which is shown in Table 15.

Table 15 Overview of the results of the hypotheses

Derived Hypotheses	**Results**
Hypothesis 1: Individuals who have a high drive for competition tend to hide knowledge.	H1 rejected
Hypothesis 2: Individually competitiveness is increased by antagonism and competitive supervisor.	H2 partially supported
Hypothesis 3: High competitive psychological climate increases the expression of knowledge hiding.	H3 supported
Hypothesis 4: Trustworthiness and Dominance have a decreasing moderating effect between competitive climate and knowledge hiding.	H4 partially supported
Hypothesis 5: Knowledge hiding among employees in cross-functional teams decreases team effectiveness.	H5 supported
Hypothesis 6: Trustworthiness to team members, interpersonal relationship commitment and organizational citizenship behaviour decrease knowledge hiding.	H6 partially supported
Hypothesis 7a: Supportive leadership moderates the impact of interpersonal relationship commitment to team-members on knowledge hiding.	H7a rejected
Hypothesis 7b: Supportive leadership moderates the impact of trustworthiness to team-members on knowledge hiding.	H7b rejected
Hypothesis 7c: Supportive leadership moderates the impact of organizational citizenship behaviour (OCB) on knowledge hiding.	H7c supported

5.2 Discussions

This work has examined three facets of perception. The first study focused on self-perception, the second on the individual's perception toward the supervisor and toward the team, and the third on the supervisor's influence on the individual. In the individual's perception toward the team, the main focus was on trust and dominance, as these play a significant role among team members in temporary teams. In the study about the influence of the supervisor on knowledge hiding in cross-functional teams, the aspects of IRC and OCB are considered in addition to the aspect of trust, as well as the influence of knowledge hiding on team effectiveness.

A personalized questionnaire, inspired by previous research, was used to explain the relationships with respondents' knowledge hiding behaviors. The results of this study extend the empirical research by suggesting that competitive perceptions encourage individuals to keep their knowledge to themselves and not share it with others in order to have a competitive advantage over their peers. In contrast, a supportive leader can ensure that knowledge is shared within the team. Several implications for the successful implementation of cross-functional teams can be derived from the results.

5.2.1 Theoretical implications

Consistent with previous findings, the results of the current study show that antagonism has a high positive correlation with individual competitiveness (H2). Antagonism is a highly controversial personality trait because in most cases it is not visibly exhibited by respondents. Coupled with several negative aspects such as malicious deviant thinking (Lee & Dow, 2011), disingenuousness, and manipulativeness (Maples et al., 2015), most respondents would not openly show their honest intentions in anonymous situations and would rather hide their antagonism, even in written form. This can be attributed to the fact that open hostility toward the status quo can be seen as unprofessional behavior or a direct attack on superiors, leading to disciplinary action or immediate dismissal of the employee. Instead, superficially hidden, so-called counterproductive workplace behaviors (CWBs) are employed by the antagonistic person. They manifest themselves in actions that are not directly measurable, but continually undermine authority and cooperative team morale. Therefore, antagonistic individuals cannot be held (directly) accountable even though they harm their work environment and the structure (Robinson & Bennett, 1995). Typical actions include deliberately reducing work speed or rudeness in the workplace. Studies have shown that antagonism is positively correlated with CWB (Berry et al., 2007); therefore, it is reasonable to

assume that antagonistic team members in cross-functional teams are more likely to act competitively and thus counterproductively.

However, the current results do not support the relationship between competitive individuals and knowledge hiding in cross-functional teams (H1); instead, a negative correlation was found, implying that higher personal competitiveness leads to less knowledge hiding. Due to a lack of further implications, it is assumed that mainly other factors lead to knowledge hiding. Hernaus et al. (2019) suggest that knowledge hiding generally increases even in the presence of competition, but predictors such as task interdependence and social support play a leading role. Employees' perceived mistrust is also positively related to knowledge-hiding behavior (Connelly et al. 2012). Excluding these factors, it appears that in a harmonious atmosphere, individuals with higher individual competition might contribute to the fact that competitive individuals are more likely to share their knowledge in the team. In a highly valued and cooperative environment, these individuals may spur their direct colleagues to higher efficiency (in an optimistic scenario). However, these intentions can also be seen as tolerated antagonism, where individuals support the team only if they derive personal benefits from it (i.e., praise from supervisor, differentiation from other colleagues, etc.) and cease all efforts once these individual benefits are no longer sustainable.

Finally, the relationship between competitive supervisors and individual competitiveness was not confirmed (H2). While previous research suggests such a relationship between a competitive supervisor and the subsequent adjustment of competitive individuals, this study shows that there is no significant relationship. Although the supervisor may have an impact on the employee, it is likely that there are other predictors that lead to whether an individual behaves competitive. First and foremost, the personal characteristics of each individual make constant and reproducible knowledge impossible. Due to individual human nature, as well as their age, experience, and mentality, individuals may react differently to the competitive attitude of their supervisor. Passive and reserved personalities might even find this type of leadership annoying or frustrating because they want to stay at their work pace and feel unnecessarily pressured by a competitive supervisor. On the other hand, some supervisors may not have the necessary leadership and social skills to effectively motivate their employees. This can result in aggressive, force-based leadership rather than cooperative and mutually complementary skills, causing peaceful and participative individuals to remain true to their cooperative intentions and refuse to conform to the characteristics of others they despise.

This assumption can be further substantiated by two relevant results. The statistical analysis shows that, first, a competitive supervisor leads to antagonism. In particular, the strong correlation

between a competitive supervisor and antagonism suggests that the environment has a strong influence on personality and behavior of the individual in teams. As mentioned earlier, this is to be expected if the competitive supervisor is not able to combine supportive leadership and mentoring with performance orientation. On the other hand, antagonism itself is the main reason for knowledge hiding, leading to lower efficiency in cross-functional teams.

In line with previous research findings, the results of the study on the perception of the individual towards the team show that moderating values, namely the interpersonal climate of colleagues and supervisor, influence the ever-increasing problem of knowledge hiding in a situation where high information and knowledge sharing is crucial. During the conducted research, competitive climate was identified as a strongly influencing variable (H3). Mandatory teamwork, as stated in the literature review, is always associated with certain difficulties, both in terms of individual members' opinions (relational conflicts) and in terms of agreement on the proposed course of action. A direct effect of mutual disapproval is the effect of knowledge hiding, which confirms the basis of this study.

However, it is important to note the distinctive feature that cross-functional teams are formed on the basis of collaborating individuals pursuing independent agendas and an organizational framework resulting from both their corporate backgrounds and personal characteristics. Because they are made up of different business units and include third parties (major customers, government officials, etc.), collisions of goals, methods, and interests are inevitable (Proehl, 1996). The additional time pressure resulting from the nature of temporary cross-functional teams inevitably leads individuals to the constraint of balancing their personal motivation with the overall group's demand for success. Despite, or perhaps because of, the existing high degree of diversified crystalline and fluid intelligence symmetry among all members, they are experienced with interdisciplinary methods and thus recognize a certain degree of professionalism and willingness to compete with unfamiliar individuals. This lays the foundation for successful cross-functional project work and enables the establishment of the next level of competition, a situation in which competitive and cooperative maxims exist simultaneously, which favors the existence of what is known as coopetition.

To further understand the influencing factors, the factor dominance of team-members was considered and its influence on psychological climate was examined, analyzing its effect on knowledge hiding (H4). After multiple testing, dominance was found not to be a significant influencing factor (H4), having little effect on the competitive climate in cross-functional teams. This result was partially expected, as individuals react differently depending on their character traits and require different leadership. While traditional team environments suffer from hostility

and psychological stress (Anand et al., 2021), the members of cross-functional teams are distinctly well-trained and experienced professionals who, in addition to acting on command, have had past experience with team leadership and cooperative leadership. These prerequisites, possibly complemented by strong character, may not tolerate excessive levels of aggressive or superior leadership. Age-related anomalies can also be ruled out, as innovative, wealthy startups, often consisting of a few individuals with highly diversified knowledge, reject traditional "ruler figures" who practice dominant leadership (Mihai et al., 2017).

Finally, the correlation between competitive climate and trust was confirmed (H4). The presence of trust allows both team leaders and team members to effectively dampen the effects and occurrence of knowledge hiding. As shown in Figure 10, this effect has limits, which means that the dangers of knowledge hiding persist, albeit in a weakened form. Moreover, it was found that even as the competitive climate increases, high levels of trust can mitigate the increase in knowledge hiding to low-to-moderate levels. Consequently, external challenges that force competition, such as changing conditions by individual supervisors, do not pose a threat to the performance and innovativeness of cross-functional teams.

In the third part of the study on the influence of the supervisor or the cross-functional team on knowledge hiding, a series of hypotheses were formulated. Hypothesis 5 focused on the factor of team effectiveness and the decreasing effect of knowledge hiding on this factor. Cross-functional teams play a special role in the scenario studied, as they consist of people from different departments pursuing different goals and using individual methods. Cross-functional teams tasked with solving interdisciplinary problems fulfill the critical role of delivering organizationally effective results. Significant levels of knowledge hiding undermine necessary information sharing, preventing out-of-the-box thinking critical to the interplay of competencies in project teams of all types (Zhang & Min, 2019).

Preventing the possibility of knowledge hiding is thus a top priority as a leader, as negative consequences can result. Systematic knowledge retention impacts the overall organizational climate, as cross-functional teams learn, reflect, and provide feedback for the entire department in the background, rather than just remaining individual experiences. Two factors in particular suffer as a result. First, the behavior of individuals are constantly changing from knowledge seekers who actively participate and share ideas, past experiences, and methods to knowledge deniers who remain silent and resist meaningful collaboration (Chatterjee et al., 2021). Second, the absence of exclusive knowledge leads to competitive advantage being lost, projects being slowed down or even stopped indefinitely, and thus crucial project success being postponed.

In addition to the consequences, the antecedents also play an important role in the risk of increasing knowledge hiding. Hypothesis 6 focused on building a trust infrastructure that negatively impacts the possibility of knowledge hiding. Trust is a variable that has long been associated with the concept of perception (Oosterhof & Todorov, 2009). Growing confidence and support from a shared mindset immensely enhances collaboration between individuals by facilitating personal psychological safety and improving collaboration in all circumstances. In this regard, the willingness to share knowledge crucially depends on the improvement of individuals' ability and willingness to learn by building trust (Zhao, 2022). In contrast, a constant lack of trust between employees can significantly hinder the sharing of important information and reduce the efficiency of collaboration.

Past literature suggested that a positive relationship between team members also leads to increased knowledge sharing (Li & Ma, 2014; Ma & Yuen, 2011). Surprisingly, IRC did not have a significant impact on knowledge hiding in this study. The past studies referred to distinct relationships, such as those that are virtual in nature (Ma & Yuen, 2011) or arise locally in organizations (Lin, 2008). At least these had in common that they can be distinct as they are not temporary. The peculiarity of cross-functional teams is that they are temporary, which means that they exist only for a limited time due to their nature, as by project or rehearsal. It would seem reasonable to assume that the temporary nature of cross-functional teams limits their ability to establish an IRC that can have an impact on knowledge hiding.

Using the results from Hypothesis 6, Organizational Citizenship Behavior (OCB) negates the effects of knowledge hiding when supportive leadership is applied. Organizational Citizenship Behavior (OCB) is a term that focuses on all voluntary behaviors of significance that accompany task-solving competence in everyday business (Kaur & Randhawa, 2021). Based on previous research, it has already been suggested that advanced OCB is expressed and developed primarily through social exchanges at vertical and horizontal hierarchical levels. Focusing on active exchange between individuals is important to create an open environment of ideas and discussion that transfers knowledge to team and organizational structures. The moderator of leadership support (H7c) has the surprising effect that the correlation between OCB and knowledge hiding decreases with higher leadership support, so that when OCB is very high (+1 SD), knowledge hiding is slightly higher with higher leadership support than without. This phenomenon can probably be explained by social desirability. Social desirability is present when respondents prefer to give answers that they believe are more likely to meet with social approval than the true answer for which they fear social rejection (Nederhof, 1985). Since both OCB and knowledge hiding are

aimed at one's own advantage and at influencing the perceptions of others, the change in trend of moderator influence can be explained.

Previous research has already established the role of leadership in knowledge hiding (Lin et al., 2020). However, only the direct effects of adaptive leadership on knowledge hiding have been demonstrated to date. Unclear boundaries cause great instability among team members and lead to conflicts at different levels. In addition, young professionals in particular require a certain level of supervision to meet the learning demands of team structures (You, 2022). This can lead to knowledge hiding becoming rampant. The findings point to a level beyond this, namely the moderating effect of leadership principles on individuals' daily decision making. Previous evidence supports the idea of moderating factors responsible for knowledge hiding in organizations; however, precise definitions have not yet been found (Xiong et al., 2021). The statistical methods used in this dissertation establish a link between the effects of leadership on OCB and its moderating role in knowledge hiding in cross-functional teams.

Overall, the dissertation provides a small perspective on the influence of maladaptive personality on knowledge hiding. It should be critically noted that this includes only a slice of personality research. Thus, maladaptive personalities are also characterized by other facets such as impulsivity, attention seeking, distractibility, irresponsibility, risk taking, and so on. Therefore, it should be kept in mind that the results regarding antagonism can be related to theoretical implications, but individuals in practice also exhibit innumerable other character traits besides this one, which can have a direct or indirect influence on knowledge hiding, OCB and competition.

5.2.2 Practical implications

Considering the results of the current study, it is hypothesized that external circumstances such as a competitive supervisor as well as personal circumstances such as antagonistic behavior patterns and competitive orientation may lead to knowledge hiding.

While highly competitive behavior of an individual itself does not directly lead to knowledge hiding, the personal behavior of an individual can be influenced by it. It is deduced that requirements for leadership techniques and a common working atmosphere are of higher importance than additional (forced) competition among team members. The risk of increasing hostility among team members can have devastating effects on the entire organizational structure in the short to long term, while providing minimal to no benefits. Managers should focus on providing comprehensive support to their employees who work in cross-functional teams in addition to their anchor department to enable collaborative working. Harmonizing operational factors such as aligned communication channels, use of tools and techniques, and clear and sufficient team responsibilities can minimize antagonistic behavior. Aligned assessment concepts and encouragement of individual problem solving within the team help establish a shared mission and value proposition, which curbs the urge to engage in narcissistic behavior while rewarding individuals for increasing their commitment to the success of the entire team. When every team member feels equally valued and respected, collaboration based on shared respect and professionalism can override a strict focus on individual goals and find a solution that benefits everyone more than just a few. It is therefore to be expected that, especially in project teams where the goals of the anchor department and the project teams are in conflict, collaborative supervisors will lead to less knowledge being hidden.

The second practical implication is that antagonistic personality traits lead to individual competition and knowledge hiding. It is suggested that regular personality development measures can reduce knowledge hiding. Recommended measures would be regular face-to-face meetings within the team to identify and discuss urgent matters and find a suitable solution for all. In addition, measures should be taken to allow criticism and constructive criticism from outside, as traditional top-down leadership could prevent all individual opinions from challenging the status quo, leading to a toxic and hostile environment.

Adding more covariances to improve the model fit yielded additional ancillary results that were not the direct goal of the study.

The influence of a competitive supervisor results in 1) the individual being more likely to behave antagonistically and 2) more likely to hiding knowledge. Past literature focused extensively on

copying leadership behaviors of others whom they saw as role models. Most studies focused on the outcome, which in most cases is positive (Manz & Sims, 1981; Walter, 1975, 1976). What has received less attention is the maladaptive behavior of leaders and the motivation to adapt these behaviors. In this regard, questions arise as to what motivational mechanisms lead to the adaptation of such behavior. It is assumed that competitive behavior of the manager is in a certain way perceived as positive and adapted, which results in an increased tendency to antagonism. In this context, it is even possible that the individual decides to hide knowledge in order to achieve certain goals.

The empirical results of the second study have significant implications for collaboration in cross-functional teams characterized by team members not knowing each other. First, the challenge of establishing trust in cross-functional teams must be overcome because project teams are temporary and interdisciplinary. If one team member disrupts sustainable teamwork during the project, it hinders the future progress of others because knowledge is not evenly distributed. To overcome the difficulty of competing goals from different anchor departments and supervisors, so-called harmonization processes must be introduced. While it seems obvious that these should be at the beginning of building cross-functional teams, schedules must be integrated into the daily workflow as priorities and other external factors change, as does the motivation of each team member.

Such practical implications pose serious challenges for individuals. Building trust in temporary, cross-functional teams to increase team effectiveness is often difficult. Moreover, trust is not the only characteristic of a first impression, because other factors such as competence, likeability, aggressiveness, and attractiveness also play a role in making a first impression (Willis & Todorov, 2006). Such factors can make it more difficult to build trust when the individuals first meet.

An increase in the competitive climate is a companion in cross-functional teams, so its presence must be accepted and cannot be fully eliminated. Managers must pursue the concept of coopetition, a hybrid structural approach that enables collaboration among team members while respecting their individual maxims and goals. Competition cannot be completely eliminated, and the actions taken by decision makers must reflect this. Because cross-functional teams are made up of experts with different knowledge and personality traits who do not work together outside of these groups, tasks and interpersonal relationships clash from day one. Only adapted and personalized strategic leadership can overcome these difficulties. Although this requires more resources and time, in the long run, by building mutual respect and getting to know each other's strengths and weaknesses, project team members can build trust to combat problems as they arise. Balancing roles with a collaborative attitude on the part of the project leader allows for the promotion of a proactive problem-solving attitude rather than the hardening of boundaries.

Finally, team members' experience with cross-functional team constellations matters. While experts have immense and valuable knowledge, they may not be familiar with the dynamics of cross-functional teams. As a result, different social skills need to develop in these young experts. Finding overlaps in skills, interests, or goals can greatly enhance interpersonal exchanges between individuals. One promising method would be to pair experienced and trained individuals with newcomers to promote knowledge sharing among individuals. Consistently establishing informal communication channels and a cooperative attitude among members helps build trust structures and prevent critical conflicts before they arise. Leaders must focus on measures to create an "all for one and one for all" mindset to unlock the high problem-solving potential and innovation-driven strengths of cross-functional teams.

Based on the results of the third study, it is strongly recommended to use an industry-dependent, differentiated and adaptive leadership style as the decision-making authority in cross-functional teams. Since all team members have different rights and organizational backgrounds, it is critical to define and enforce clear boundaries and directive authority to ensure effective communication and collaboration across the team. Establishing reliable and personalized procedures that accompany each team member allows for continuous improvement of the status quo, effective executive-level decision making, and evaluation of overall team performance (Pinto-Santos et al., 2022). Inadequate leadership can spiral out of control as other factors that promote knowledge hiding take over (Xiong et al., 2021). In addition, negative characteristics such as antagonism are disruptive factors to the integrity of current and future cross-functional team projects (Ton et al., 2022b).

By focusing on mutual recognition among team members and fostering the building of a shared vision, the space for a potential buildup of knowledge hiding places can be sustainably eliminated. This tool requires moving away from an individual and egocentric view to a collective focus that can only be achieved through shared decisive leadership. Key performance indicators rely on the manifestation of a stability-oriented environment that allows for critical discussion of ideas while ensuring a resilience-based tone that accepts the abandonment of failed concepts or ideas (Zhang & Min, 2019). As technology advances, communication systems, data clouds, and online work have become the norm. However, simple implementation is insufficient, as a team-tailored learning strategy that fits the framework of the entire organization is critical to foster trust-based team learning (Yamani et al., 2022).

Methods for managers and decision makers revolve around steps to implement higher levels of perceived fairness among team members to enable attitudes toward knowledge sharing that have

positive connotations. Similarly, positive and constructive feedback can reduce the intent of cross-functional team members to engage in knowledge hiding in the first place.

Furthermore, higher levels of participation in cross-functional teams encourage individuals at all levels to interact and engage to a greater degree than with stricter, authoritarian leadership methods (Kaur & Randhawa, 2021). Drawing on models of individual employee needs, it is clear that higher fulfillment of these needs positively increases willingness to engage in decision-making processes. Finally, cross-industry competencies need to be managed, as individual team members' backgrounds in finance, organization, routine, and communication habits differ by industry. Applied and user-friendly infrastructures, including user-friendly UX design, are known as a concept but have not yet been fully elaborated, so not only content but also methodological improvements are possible (Saleh et al., 2022). In addition, the cultural and legal frameworks that are present in networked supply chains need to be considered to enable successful knowledge transfer.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Limitations and suggestions for future research

Despite the many contributions of this research, some limitations must be acknowledged. First, the limitations of the methodology are discussed. Only participants in Europe were considered in the analysis of the study. Due to the significant differences in autonomy, culture, industry standards and management structures between the various geographical locations, these results only reflect the situation in the given environment; studies in other regions could lead to very different results. Regional bias cannot be ruled out with certainty. Furthermore, this study did not focus on a single industry sector and represents a broad cross-section of industries.

Moreover, not all levels of short-term coopetition influencing factors were considered. Above all, the duality between orientation toward team goals and orientation toward individual goals plays a significant role in the short-term scope of action of all cross-functional team members. Only external respect for individual goals and internal willingness to limit individual expectations to a successful team goal without immediate gain can ensure the success of these projects.

Depending on the creative latitude required in certain areas (e.g., marketing, communications, or project management as opposed to strict manufacturing or sales environments), collaboration is expected from each member within a team much more than in other areas. A need for individually tailored and customized leadership methods is critical; standardized measures that usually work are not applicable.

The majority of the sample studied belongs to the 21- to 30-year-old age group. Although previous studies have already indicated that age is not directly correlated with knowledge hiding (Connelly et al., 2012; Peng, 2013; Yao et al., 2020), other studies show that maturity effects among individuals have an influence on knowledge hiding. Demirkasimoglu (2015) showed statistically significances of academics toward their co-workers. Research assistants are more likely to show incorrect knowledge to their supervisor than professors do. Research assistants are also more likely to use the strategy of playing dumb. Professors are more likely to provide justification for not disclosing requested information in this regard (Demirkasimoglu, 2015). Since research assistants are on average significantly younger than the equivalent professors, the study shows a clear difference in the way knowledge is concealed. Since the position of professor requires significantly more years of professional experience than that of a research assistant, it is reasonable to assume that knowledge hiding changes with the maturity or age of the individual.

Peng (2013) also shows with his results that age and knowledge hiding do not correlate directly to each other, but managers hide significantly less knowledge than employees without management responsibility. Again, this shows that the maturity of the individual, which the person is known to acquire over the years, plays a role in knowledge retention. Most of the literature agrees that age alone is not sufficient to predict knowledge hiding. It is primarily factors that have an influence on the maturity of the employee (e.g., job position with higher responsibility, level of education) that have an impact on knowledge hiding. It can therefore be assumed that age and knowledge hiding are more likely to be mediated or moderated by such factors and the outcome could change, if those peer-groups are included into the studies.
While further insights into coopetition have been gained in previous divisions (Crick & Crick, 2020), further empirical research should focus on other social science factors that influence knowledge hiding and were not considered in this study.

This includes, but is not limited to, the
Research Question 1: As organizations increasingly adopt cross-functional teams, how do strategic decision makers ensure the integrity of their organizational structures and rules?
Research Question 2: Balancing participants' interests in cross-functional teams: How are team goals and individual goals related and pursued by each team member?
Research Question 3: The essence of educational models is present in groups with both heterogeneous and homogeneous knowledge diversification. How differently does organizational behavior affect group members' willingness to synergize?
Research Question 4: What factors negate the strong positive correlation of antagonism toward individual competitiveness and knowledge hiding when the latter is negatively correlated with knowledge hiding?

In addition, changes in the statistical evaluation can also be taken into account, namely:

Research Question 5: Do general data, such as gender, cultural background, or age, significantly alter the outcomes evaluated in this study?
Research Question 6: How do changing conditions, i.e., external disruptors such as pandemonium and digital work, affect the efficiency and daily operations of cross-functional teams in knowledge sharing?
Research Question 7: Are there significant differences across industry sectors (particularly between nonprofits and similar organizations) in the impact of knowledge relocation?

Research Question 8: Are international teams more prone to lack of trust in interpersonal relationships due to language, ethical, or cultural differences?

Research Question 9: To what extent is knowledge hiding and the resulting moderating effects influenced by other short-term variables such as appearance, posture, and language at the first meeting?

6.2 Conclusions

The aim of this work was to analyze factors that hinder efficient task resolution in cross-functional teams by statistically investigating direct causal effects on the topic of knowledge hiding. First, the different phases of purposeful retention of information and knowledge were presented. The literature review revealed that several factors, mainly the perception of being antagonistic, perception of competitive supervisor behavior and the competitive climate towards the team, could be relevant factors for deliberate knowledge hiding. Therefore, two main hypotheses were formulated. Using a questionnaire that contained items derived from recent findings on antagonistic behavior, the following core findings could be defined:

Knowledge hiding is one of the greatest potential threats to the efficiency of cross-functional teams. Antagonism seriously threatens individuals' willingness to share knowledge. Competitive behavior of supervisors influences the development of antagonism both positively and negatively, with negative experiences being significantly more dominant and thus affecting knowledge hiding. Individual competitiveness does not clearly affect knowledge sharing within the team, but is hypothesized to have a highly fluctuating influence on it.

In conclusion, it was found that the reasons for knowledge hiding are not singular, but rather a complex mix of the aforementioned leadership characteristics and organizational and workplace rules and regulations. Each individual resorts to antagonistic behaviors based on their values and experiences, which are caused by various confounding factors that must be reduced in order to promote successful cross-functional teamwork.

The objective of the second part of the study was to analyze three factors influencing knowledge hiding in cross-functional teams. Three main variables were statistically examined for their direct casual effects on knowledge hiding, namely competitive climate and its own moderating effects of dominance and trust.

First, the technical terms and variables used were described. Knowledge hiding is a highly developed disruptive factor in cross-functional teams, which are characterized by their heterogeneous knowledge distribution. Only consistent and supportive leadership can successfully ensure the achievement of performance goals. The literature review documented previous research on the stages of knowledge hiding in team structures. To test the feasibility of this study, the first step was to formulate the statistical relationship between competitive climate and knowledge hiding as a hypothesis. This was followed by additional hypotheses that dove deeper into analyzing the factors influencing the research question.

The study was conducted using a self-administered questionnaire based on the findings of previous research. The following findings were collected: Cross-functional teams are based on the premise that increasing competition is associated with high levels of knowledge hiding. Although the nature of these teams makes them less likely to suffer from competitive structures, as shown in previous research, the effects of knowledge hiding can severely impact their productivity and therefore should be considered a high potential threat. In addition, the analysis of two moderating effects was considered: Dominance, indicating strict hierarchical and power-dependent interpersonal relationships, and trust, a characteristic feature of reliability between individuals. While the effects of dominance on knowledge hiding were not demonstrated, the effect of trust as a moderating factor was identified. The presence of highly established trust factors cannot prevent the risk of intentional withholding of knowledge or information, but can become an anchor in a constantly escalating competitive environment.

The goal of the third study was to analyze additional factors that positively and negatively affect or respond to knowledge hiding in cross-functional teams. Based on existing publications, several further hypotheses were formulated. The methodology used includes a survey consisting of several questionnaires focusing on interpersonal relationship commitment of employees, cross-team trustworthiness, and Organizational Citizenship Behavior in combination with the moderating factor leadership. The following core findings could be defined: Knowledge hiding has a detrimental effect on the effectiveness of team structures and hinders innovation. The trust factor is one of the few effective methods for promoting knowledge sharing and bridging interpersonal conflicts, regardless of experience, authority, area of expertise or age. Supportive leadership tailored to individual team members, as well as clear rules and tasks, help to foster organizational behavior among individuals, thus providing a solid foundation for open and unhindered knowledge sharing.

7 NEW SCIENTIFIC RESULTS

The dissertation addresses, on a psychological level, the impact on individuals' perceptions of knowledge sharing behavior in cross-functional teams. It is not the first publication to address knowledge management of teams. Nor is it the first publication to address individuals' perceptions towards others. The novelty of the dissertation lies in the research context of cross-functional teams with the specificity of coopetition, i.e., the simultaneous existence of cooperation and competition.

1. The dissertation introduces the use of coopetition of cross-functional teams. It concludes the teamwork has short, medium and long-term effects, that shape the future development of practicing organizations at the methodological and interdisciplinary levels. In the relationship between profitability and time expenditure, the most favorable ratio is found primarily at the relationship level. Factors involving the individual, management, or team can lead to great success and greater knowledge transfer between team members with relatively little effort. Novelty: This dissertation is the first to summarize the implications of cross-functional team coopetition for knowledge management behavior through a systematic review.
2. The research concludes that firstly individuals who have a high drive for competition do not tend to hide knowledge, but it is the opposite case ($r = -0.2$, $p < 0.01$). Secondly, that antagonism significantly leads to individual competitiveness ($r = 0.41$, $p < 0.01$), but individual competitiveness is not increased significantly by a competitive supervisor ($r = 0.18$, $p > 0.05$). Novelty: It provides a first study of self-perceptions of maladaptive personality traits among members of cross-functional teams in competition.
3. The research shows that competitive climate leads to knowledge hiding ($\beta = 0.37$, $p < 0.01$) and interacting with trustworthiness ($\beta = -0.07$, $p < 0.01$). In contrast, the perception of dominant team members has no interaction effect. Novelty: It is the first study of perception within a cross-functional team and the impact on knowledge hiding.
4. The research provides that knowledge hiding among employees in cross-functional teams decreases team effectiveness ($\beta = -0.48$, $p < 0.01$). Both trust and organizational citizenship behavior lead significantly to lower knowledge hiding ($\beta = -0.25$, $p < 0.05$; $\beta = -1.04$, $p < 0.01$), while interpersonal relationship commitment does not ($\beta = 0.01$, $p > 0.05$). Leadership moderates the effect between organizational citizenship behavior and knowledge hiding, so high leadership weakens the effect ($\beta = 0.01$, $p < 0.05$). Novelty: First study to examine moderating influence of supervisors on cross-functional teams.

Table 16 summarizes the new scientific findings of the dissertation.

Table 16 Overview of new scientific results

Topics	**Novelty**	**Results**
Cross-functional team collaboration	First summary of implications for knowledge management behavior in cross-functional team collaboration through systematic review of multiple studies.	The use of coopetition in internal and external scenarios during teamwork has short, medium and long-term effects that shape the future development of the practicing companies on a methodological and interdisciplinary level.
		In the relationship between profitability and time horizon, it is primarily the relationship level that is most favorable. Thus, the lever also works through improvements at the level of stronger knowledge transfer between team members
Self-perception	First study of self-perceptions of maladaptive personality traits among members of cross-functional teams in competition.	Individuals who have a high drive for competition do not tend to hide knowledge, but it is the opposite case ($r = -0.2$, $p < 0.01$).
		Antagonism significantly leads to individual competitiveness ($r = 0.41$, $p < 0.01$).
		Individual competitiveness is not increased significantly by a competitive supervisor ($r = 0.18$, $p > 0.05$).
Perception towards the cross-functional team	First study of perceptions within the cross-functional team and the impact on knowledge hiding	Competitive climate leads to knowledge hiding ($\beta = 0.37$, $p < 0.01$) and interacting with trustworthiness ($\beta = -0.07$, $p < 0.01$).
		In contrast, the perception of dominant team members has no interaction effect.
Influence of the supervisor	First study to examine the moderating influence of supervisors on cross-functional teams	Knowledge hiding among employees in cross-functional teams decreases team effectiveness ($\beta = -0.48$, $p < 0.01$).
		Both trust and organizational citizenship behavior lead significantly to lower knowledge hiding ($\beta = -0.25$, $p < 0.05$; $\beta = -1.04$, $p < 0.01$), while interpersonal relationship commitment does not ($r = 0.01$, $p > 0.05$).
		Leadership moderates the effect between organizational citizenship behavior and knowledge hiding, so high leadership weakens the effect ($r = 0.01$, $p < 0.05$).

The study also revealed the following three secondary findings resulting from the structural equation model from study I):

1. Individuals who have a competing supervisor are more likely to be antagonistic ($r = 0.48$, $p < 0.01$).
2. Individuals who have a competing supervisor are more likely to hide knowledge ($r = 0.33$, $p < 0.01$).
3. Individuals who are highly antagonistic are more likely to hide knowledge ($r = 0.79$, $p < 0.01$).

These results are obtained from the statistical equations of factors that were not directly the subject of the study but were discovered when testing the quality of the applied model.

8 SUMMARY

In times of financial crisis, companies draw consequences and restructure their businesses, with the result that some of the workforce is laid off. This has the consequence that the resulting insecurity in the workplace disrupts cooperation among employees. Especially in cross-functional teams, where there is no relationship between the employees due to the temporary composition, competition arises among the cooperators. This type of coopetition involves certain risks in the form of knowledge hiding. In order to understand the management of knowledge in cross-functional teams, this dissertation first investigated the factors related to knowledge management in cross-functional teams. While several studies have described that the relationship between individuals carries a large role in how and whether knowledge is concealed, the effects of perception have not been addressed in the existing literature. A mapping of factors to the relationship between time horizon and profitability shows that the largest influences are self-perception, leadership, and team climate.

Based on the results, three sub-studies on the perception of the individual were conducted. The first study examined the individual's self-perception and perception of the supervisor. The results show that individuals who have high levels of individual competitiveness do not necessarily hide their knowledge. It is even the reverse case that high individual competitiveness leads to lower knowledge hiding. Antagonism, on the other hand, leads to increased competitiveness, while a competitive supervisor has no effect on it. The results show that especially a maladaptive personality named antagonism has a great influence on the factors, because antagonism leads in addition to the competitive orientation also directly to an increased knowledge hiding.

The second study examined the individual's perceptions towards the team. The results show that competitive climate in the team leads to knowledge hiding. This effect is moderated by trust. The correlation between competitive climate and knowledge hiding becomes significantly weaker when the level of trust is high. When the competitive climate is low, trust has no significant effect. These results provide insight into cross-functional teams. Although often such teams are not characterized by a high level of close relationship, trust is nevertheless an important factor, especially in competitive teams, to work without knowledge hiding. Dominance, on the other hand, directly affects knowledge hiding, but has no moderator influence through competitive climate.

The third study used the results to determine the influence of the supervisor on the individual's knowledge hiding. From the results, important insights emerge on organizational citizenship behavior, also described as the individual's voluntary action at work, which is raised by the latent variables altruism, conscientiousness, sportsmanship, courtesy, and civic virtue. Higher

organizational citizenship behavior (OCB) leads directly to lower knowledge hiding. This relationship is moderated by leadership support. Knowledge hiding is more prevalent at low OCB and low leadership support than at higher leadership support. A slight reversal occurs at high OCB. Knowledge hiding is slightly more common with high leadership support.

Overall, the results provide strong evidence that self-perceptions, perceptions toward the supervisor, and toward the team can have a critical influence on knowledge hiding within the team. In competitive climates, trust may lead to less knowledge hiding. Also, voluntary workplace behaviors that have a positive impact on organizational citizenship behavior (OCB) lead to less knowledge being hidden. A supportive leader can help ensure that knowledge is shared but must understand the maturity level of employees and adjust accordingly, as the moderator influence of the leader can reverse based on the expression of OCB. With these insights, it is possible for the leader to limit employee knowledge hiding in uncertain times and increase the effectiveness of cross-functional teams.

In summary, it can be said that the perceptions of individuals in cross-functional teams play a significant role in knowledge hiding. Even though not all of the hypotheses stated here could be definitively confirmed, the new scientific findings regarding knowledge hiding should be helpful to future managers and employees of cross-functional teams. The benefits of this research are twofold: In practice, cross-functional teams are increasingly used for interdepartmental projects. The resulting problems due to a lack of close relationship between team members hinder team success. The results presented here provide a promising approach for achieving team success in this regard. Not only the effects of the leader's actions are shown, but also the psychological perception and attitude of the team member. The results therefore benefit both the manager and the team members for reflection and thus also for the success of cross-functional projects.

Nevertheless, it should be critically noted at this point that the significance of personality traits or entire personality type descriptions should not be overestimated. Antagonism, which is described by the characteristic deceitfulness, grandiosity, manipulativeness, are to be understood dimensionally and no mere black-and-white categorization. It should be considered that the factors that lead to knowledge hiding are much more complex than the factors examined here. It must be assumed that other factors, such as those relating to social background (e.g., cultural circle, level of education, origin of parents), play an additional supporting role that must not be disregarded under any circumstances.

9 APPENDICES

Appendix A: Bibliography

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Appendix B: Structured questionnaire of the study I)

Classification		Items	11 Point Likert Scale (0 = I Don't Agree; 11 = I Fully Agree						Source
			0	2	…	…	10	11	
Antagonism	Deceitfulness	I often make up things about myself to help me get what I want.							Maples et al. 2015
		I don‘t hesitate to cheat if it gets me ahead.							
		I use people to get what I want.							
		I‘ll stretch the truth it‘s to my advantage.							
	Grandiosity	To be honest, I‘m just more important than other.							
		I‘m better than almost everyone else.							
		I deserve special treatment.							
		I often have to deal with people who are less important than me.							
	Manipulativeness	I‘m good at making people do what I want them to do.							
		Sweet-talking others helps me get what I want.							
		I‘m good at conning people.							
		It is easy for me to take advantage of others.							
Competitive supervisor		My manager frequently compares my results with those of others							S. P. Brown et al. 1998
		The amount of recognition you get in this company depends on how your rank compared to others							
		Everybody is concerned with finishing at the top of the rankings							
Individual competition		Performing better than others on a task is important for me							Author
		If I do a good job, it can open up new career paths for me later on							
		I try harder when I am in competition with other people.							
		If I meet the goals that my supervisor gives me, that will help me later on in my career.							
Knowledge hiding	Rationalizes hiding	In this specific situation, I explained that I would like to tell him/her, but was not supposed to							Connelly et al. 2012
		In this specific situation, I explained that the information is confidential and only available to people on a particular project							
		In this specific situation, I told him/her that my boss would not let anyone share this knowledge							
		In this specific situation, I said that I would not answer his/her questions							

	Playing dumb	In this specific situation, I pretended that I did not know the information							
		In this specific situation, I said that I did not know, even though I did							
		In this specific situation, I pretended I did not know what s/he was talking about							
		In this specific situation, I said that I was not very knowledgeable about the topic							
	Evasive hiding	In this specific situation, I agreed to help him/her but never really intended to							
		In this specific situation, I agreed to help him/her but instead gave him/her information different from what s/he wanted							
		In this specific situation, I told him/her that I would help him/her out later but stalled as much as possible							
		In this specific situation, I offered him/her some other information instead of what he/she really wanted							

Appendix C: Structured questionnaire of the study II)

Classification	Items	Source
Rationalized hiding	In this specific situation, I explained that I would like to tell him/her, but was not supposed to	(Connelly et al., 2012)
	In this specific situation, I explained that the information is confidential and only available to people on a particular project	
	In this specific situation, I told him/her that my boss would not let anyone share this knowledge	
	In this specific situation, I said that I would not answer his/her questions	
Playing dumb	In this specific situation, I pretended that I did not know the information	
	In this specific situation, I said that I did not know, even though I did	
	In this specific situation, I pretended I did not know what s/he was talking about	
	In this specific situation, I said that I was not very knowledgeable about the topic	
Evasive hiding	In this specific situation, I agreed to help him/her but never really intended to	
	In this specific situation, I agreed to help him/her but instead gave him/her information different from what s/he wanted	
	In this specific situation, I told him/her that I would help him/her out later but stalled as much as possible	
	In this specific situation, I offered him/her some other information instead of what he/she really wanted	
Competitive climate	My manager frequently compares my results with those of other […].	(Brown et al., 1998)
	The amount of recognition you get in this company depends on how you are rank compared to other […].	
	Everybody is concerned with finishing at the top of […] rankings.	
	My coworkers frequently compare their results with mine.	
Dominance	The colleagues in the cross-functional teams like to give orders to get things moving.	(Gough et al., 1951)
	The colleagues have often enjoy planning things, and deciding each person has to do.	
Trust	I trust in the work of my colleagues in the cross-functional team.	Author
	The colleagues have always done a satisfactory job so far without me having to check.	

Appendix D: Structured questionnaire of the study III)

Category		**Items**	**Source**
Interpersonal relationship commitment		I am willing to put in a great deal of effort beyond that normally expected in order to help my teammember be successful.	(Mowday et al., 1979)
		I talk up this cross-functional team to my friends as a great team to work for.	
		I would accept alsmost any type of job assignment in order to keep working for this cross-functional team	
		I find that my values and the cross-functional team's value are very similar.	
		I am proud to tell others that I am part of this cross-functional team	
		This cross-functional team really inspires the very best in me in the way of job performance.	
		I really care about the fate of this cross-functional team.	
Organizational citizenship behaviour	Altruism	Helps others who have heavy work loads	(Chiang & Hsieh, 2012)
		Helps others who have been absent	
		Willingly helps others who have work related problems	
		Helps orient new people even though it is not required	
		Is always ready to lend a helping hand to those around him/her	
	Courtesy	Takes steps to prevent problems with other workers	
		Is mindful of how his/her behavior affects other people’s jobs	
		Does not abuse the rights of others	
		Tries to avoid creating problems for coworkers	
		Considers the impact of his/her actions on coworkers	
	Civic virtue	Attends meeting that are not mandatory, but are considered important	
		Attends functions that are not required, but help the company image	
		Keeps abreast of changes in the organization	
		Reads and keeps up with organization announcements, memos, and so on	
	Sportsmanship	Consumes a lot of time complaining about trivial matters (R)	
		Always focuses on what’s wrong, rather than the positive side (R)	
		Tends to make “mountains out of molehills” (R)	
		Always find fault with what the organization is doing (R)	
		Is the classic “squeaky wheel” that always needs greasing (R)	

	Conscientious-ness	Obeys company rules and regulations even when no one is watching	
		I am one of my most conscientious employees	
		Believes in giving an honest day's work for an honest day's pay	
Knowledge Hiding	Rationalized hiding	In this specific situation, I explained that I would like to tell him/her, but was not supposed to	(Connelly et al., 2012)
		In this specific situation, I explained that the information is confidential and only available to people on a particular project	
		In this specific situation, I told him/her that my boss would not let anyone share this knowledge	
		In this specific situation, I said that I would not answer his/her questions	
	Playing dump	In this specific situation, I pretended that I did not know the information	
		In this specific situation, I said that I did not know, even though I did	
		In this specific situation, I pretended I did not know what s/he was talking about	
		In this specific situation, I said that I was not very knowledgeable about the topic	
	Evasive hiding	In this specific situation, I agreed to help him/her but never really intended to	
		In this specific situation, I agreed to help him/her but instead gave him/her information different from what s/he wanted	
		In this specific situation, I told him/her that I would help him/her out later but stalled as much as possible	
		In this specific situation, I offered him/her some other information instead of what he/she really wanted	
Leadership support		The supervisors can understand my situation and give me encouragement and assistance	(Dai et al., 2013)
		The supervisor encourages me to take the pandemic as challenges	
		The supervisor encourages us to make efforts towards fulfilling the company vision during the pandemic	
		The supervisor encourages me to think about the pandemic from a new perspective	
Trust		I think the people in cross-functional teams tell the truth in negotiations.	

	I think that the team members meet is negotiate obligations to our department	(Cummings & Bromiley, 1996)
	In our opinion, my team member is reliable	
	I think that people in cross-functional teams succeed by stepping on other people.	
	I feel that cross-functional team member tries to get the upper hand.	
	I think that some cross-functional team member take advantages of my problems.	
	I feel that cross-functional team member negotiates with us honestly	
	I feel like that cross-functional team member will keep their words.	
	I think cross-functional team member do not mislead me.	
	I feel like that cross-functional team member try to get out of ist commitments	
	I feel like that cross-functional team member negotiate joint expectations fairly	
	I feel like cross-functional team member take advantages of people who are vulnerable	
Team effectiveness	Our team is fulfilling specific job responsibilities	(Chiang & Hsieh, 2012)
	Out team meets performance standards and expectations	
	The team performance level is satisfactory	
	Our team is effective	
	Our team performs better than many other teams which perform the same job	
	Our team produces high-quality work	

Appendix E: List of publications

The publications on the topic of the dissertation

A. D. Ton, L. Hammerl, G. Szabó-Szentgróti (2022). Trust and Dominance: The dark side of competitive climate on knowledge hiding in cross-functional teams, *Knowledge Management Research & Practice, in review*

A. D. Ton, L. Hammerl, O. Kremer, D. Weber, G. Szabó-Szentgróti (2022). Why leaders are important for cross-functional teams: Moderating role of supportive leadership on knowledge hiding, *Problems Perspectives in Management (20)3,* p. 178 - 191, http://dx.doi.org/10.21511/ppm.20(3).2022.15

A. D. Ton, L. Hammerl, G. Szabó-Szentgróti (2022). Using smartphones to prevent cross-functional team knowledge hiding: The impact of Openness & Neuroticism, *International Journal of Interactive Mobile Technologies 16(11)* p. 163-177, https://doi.org/10.3991/ijim.v16i11.30503

A. D. Ton, G. Szabó-Szentgróti L. Hammerl, (2022). Competition within cross-functional teams: A structural equation model on knowledge hiding, *Social Sciences (11)1*, pp. 1 - 16 https://doi.org/10.3390/socsci11010030

A. D. Ton, L. Hammerl, G. Szabó-Szentgróti (2021). Factors of cross-functional team coopetition: A systematic literature review, *Performance Improvement Quarterly*, *in press*

A. D. Ton (2021). Cross-functional team coopetition to improve SDG 8.4: A fuzzy-set qualitative comparative analysis, *Regional and Business Studies (13)1,* pp. 1 - 15, https://doi.org/10.33568/rbs.2539

A. D. Ton, L. Hammerl (2021)**.** Knowledge management in the environment of cross-functional team coopetition: A systematic literature review, *Knowledge and Performance Management 5 (1)*, 14-28, http://doi.org/10.21511/kpm.05(1).2021.02

A. D. Ton, D. Weber, L. Hammerl (2021). How coopetition of cross-functional teams become important in times of COVID-19 in carpathian basin: A Grounded Theory, *15th International Conference on Economics and Business,* pp. 810 - 834, ISBN 978-973-53-2752-1

The published papers that do not relate to the topic of the dissertation.

A. D. Ton, S. Berke, L. Hammerl, (2022). A fuzzy-set qualitative comparative analysis of Maslow's 8th level pyramid on manager's willingness to change the job, planned in *Int. J. of Human Resources Development and Management,* in review

L. Hammerl, D. Weber, **A. D. Ton** (2021). Kaizen in Automotive Innovation: How the Hungarian Automotive Clusters can profit from the Adoption of Kaizen Principles, *International Journal of Applied Research in Business and Management*, https://doi.org/10.51137/ijarbm.2021.2.2.3

D. Weber, **A. D. Ton**, L. Hammerl (2021). Business resilience through AI expertise – an opportunity for rural economies?, *15th International Conference on Economics and Business*, pp. 192 – 207, ISBN 978-973-53-2752-1

A. D. Ton, S. Robus (2020). Influence of face mask on perceived dominance and trustworthiness in times of COVID-19, *Proceedings of the 7th VUA YOUTH scientific session*, pp. 281 - 293. ISBN 978-963-269-930-1

10 ACKNOWLEDGEMENTS

In 2020, I started my PhD program. Since then, it took me many days and nights to work on this dissertation. Even though it was very time consuming, intense and exhausting, I never thought of giving up. There are several people without whom the doctoral studies would not have been possible. I am very grateful for their support.

First of all, I would like to thank Milena Greve, who always supported me during the work on my dissertation, who always had an open ear and who was always ready to help me with the day and night work. Without you, the dissertation would not have been written in this form.

Another thank you goes to my family and friends who supported me during the time and showed understanding when I had to skip a party.

As far as the academic side is concerned, I would like to thank my PhD supervisor, Dr. Gábor Szábo-Szentgróti, who supported me very well. Without his ideas, advice, and supportive power, this dissertation would never have come to fruition. He is characterized by fast communication, mutual respect and enthusiasm. A special thanks to my co-author Laszlo Hammerl, with whom I worked closely on the publications. Without your cooperation, the publications would not have been accepted so quickly. I would also like to thank Zsófia Móga and Dr. Kinga Szabó for their excellent coordination of the PhD program.

Finally, I am grateful to have such great fellow students, both from my own and previous cohorts. The opportunity to experience both disciplined and fun times in Hungary has encouraged me to look at life in a new way.

11 DECLARATION

I hereby declare that I have written this dissertation myself and have not used any auxiliary materials other than those indicated. The dissertation consists of parts of my own published work as first author. I have marked all verbatim or substantive passages as such, which are listed in the bibliography.

I hereby declare that this thesis is my own work, prepared after registration for the Ph.D. degree at the Hungarian University of Agriculture and Life Sciences Kaposvár Campus, and that it has not previously been included or submitted in any work at this or any other institution for a degree, diploma, or other qualification.

I have read the current University Ethics Policy and accept responsibility for the conduct of the procedures. I have attempted to identify all risks associated with conducting this research, have obtained the appropriate ethical and/or safety approval (if applicable), and acknowledge my obligations and the rights of participants.

Kaposvár, November 02, 2022 Anh Don Ton