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Competition within Cross-Functional Teams: A Structural Equation Model on Knowledge Hiding

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Abstract: The modern challenges of business success make the use of interdisciplinary cross-functional teamwork necessary to tackle social and economic issues alike. The study examines the role of knowledge hiding in within-team coopetition, taking into account its subsequent factors influencing team efficiency. For the investigation, a self-made model was applied that associates the personality of individuals, their role inside the organization and work-environmental aspects with the individual's behavior as the antecedent of within-team competition. The objective of this study revolves around the question of which factors apply to the efficiency of cross-functional teams. The modern concept of interdisciplinary coopetition faces more difficulties than traditional teams regarding voluntary adoption in new environments. The model was empirically applied to a dataset of 129 participants working in cross-functional teams. Three hypotheses were drafted and statistically evaluated. The factor of knowledge hiding was evaluated as one of the crucial factors blocking the efficiency of team-based work, based on the results from the literature review. This was further fueled by antagonistic behavior and a competitive supervisor. The empirical findings further elaborate that individuals with a competitive supervisor tend to be more antagonistic and competitive themselves. Equally, a highly developed personality trait of antagonism correlates positively with knowledge hiding, thereby resulting in the limiting of team performance. Surprisingly, competitiveness among individuals is negatively correlated with knowledge hiding, indicating that different personality traits and different real-life situations react drastically differently towards competitive environments. The results close the research gap of a strategic necessity for supervisors and managers designing business organizations alike, namely, that an individually adapted and situationally aware leadership is indispensable for a successful cross-functional team approach, even more than in traditional team compositions. As for now, only the effects on personality in educational environments were discussed in previous research.

Keywords: economics; competition; antagonism; knowledge hiding; leadership; work; employment

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1. Introduction

With the increase in interdisciplinary work in industry, the challenges for the successful collaboration of cross-functional teams are growing. A cross-functional team is a group of members with different expertise (Ghobadi and D'Ambra 2013) working together towards a common and shared goal, expecting to be more creative, innovative (Sethi et al. 2001) and successful (Ernst et al. 2010) during the process. The gain in growing competencies is imperative to provide competence gains and productivity to meet increasingly complex market requirements. Cooperation, however, clashes directly with the individual goals of each team member, leading to an interplay between cooperation and competition, also called coopetition. This concept takes a central position to meet the demands of the market (Galpin et al. 2007). Initial studies investigated the effects of coopetition within teams, with

its biggest impact on knowledge management and its subtopics including, but not limited to knowledge sharing (Tsai 2002), quality of knowledge and skills (Ghobadi and D'Ambra 2012a, 2012b) and social cohesion (An et al. 2020; Knein et al. 2020; Strese et al. 2016). These factors in particular lead to short-, mid- and long-term success in cross-functional teams and are key influencers on performance among whole organizations (Ton and Hammerl 2021).

Nonetheless, cross-functional teams can also lead to the opposite result if the interplay and balance between cooperation and competition is uneven. A classic example derives from studies that determined that higher competition results in a negative impact on knowledge management, and specifically that high competition leads team members to withhold their knowledge on purpose, treating it as an exclusive asset and thereby treating it as an individual advantage (Connelly et al. 2012). However, this advantage is strictly limited to the personal gain of said individual, consequently drastically lowering the other team members' performance due to lack of knowledge. In the following, a short insight into the predictors of knowledge hiding and their multifaceted origins are presented, focusing on the specifics of cross-functional teams.

In past literature, task conflicts or relationship conflicts between team members were named as the factors with the highest influence. Due to the nature of disagreement, either on a professional or emotional level, internal congruency amplifies competition and thus knowledge retention (Boz Semerci 2019). Constant disturbance due to interpersonal antecedents over the long term cause a variety of effects, i.e., job insecurity (Serenko and Bontis 2016), general distrust in the organizational structure of the company (Černe et al. 2014; Connelly et al. 2012), time pressure and resulting medical consequences (Connelly et al. 2014) and workplace discrimination (Zhao et al. 2016).

However, the circumstances of team-work projects are essential, as cross-functional teams are often characterized by different individuals from different departments who work together in a team in a strictly temporary time frame. In contrast to long-term teams, cross-functional teams originate from different departments, thereby following different leadership principles, organizational structures and strategic goals, due to the different anchor departments each member is from. With small time frames for adjustment and assimilation, these critical circumstances drastically influence the problem-solving experiences of the individual team members, leading to unavoidable interest conflicts. The core strength of cross-functional teams, namely, holistic and expertise-driven problem solving, is only viable if the interpersonal connection between team members is harmonized, as knowledge hiding is one of the biggest dangers to the success of these collaborations.

Empirical studies regarding the analysis of relevant predictors that lead to knowledge retention, especially in cross-functional teams, scarcely exist in the current literature. This paper examines the circumstances and origins of the individual team member under coopetitive tensions that lead to knowledge hiding within cross-functional teams.

The paper includes an extensive literature review regarding the pillars and the definition of knowledge hiding. Later, the concept of competition and cooperation are briefly introduced, featuring a hybrid of those concepts: so-called coopetition. This phenomenon is not typically associated with teamwork, and underlies the obstacles of modern interdisciplinary work projects. Subsequently, three hypotheses are presented, each discussing their origin by including the previous and current research and following a consecutive chain of thought. Supplemented by defining their statistical methods, the authors will discuss the results of the study and derive theoretical as well as practical implications, before defining an outlook on its limitations and the possibility of conducting potential future research, mainly focusing on improving strategic decision making among cross-functional teams in business environments.

Current research has already identified the necessity for trust-based management practices and the need for prearranged processes to ease the strength-enhancing, albeit challenge-posing social factors in team environments (age, gender, diversity, job position etc.) (Henson et al. 2020). Furthermore, previous research has acknowledged the level of commitment as being central to the success of a project, as individual interests and

inter-team communication dictate acknowledgement and respect among each member (Ghazinejad et al. 2018).

These studies, however, focused solely on research environments (Pei-Lee et al. 2017; Zawawi et al. 2011), analyzing a particular sector, which is independent from the economic efficiency of industrial expectations and has significantly higher interconnectivity than company departments in traditional labor markets. Additionally, these environments offer a significantly higher base of proactive cooperation among differing interests and simultaneously belong to the same organizational unit (i.e. the same professor, chair or project) during an extended timeline.

Literature Review and Hypotheses

To discuss the origins of the intentional restraint of knowledge, the term *knowledge hiding* must be defined. The term is described as an "intentional attempt by an individual to withhold or conceal 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 and Bontis 2016). In the following, the different peculiarities of knowledge hiding are demonstrated to highlight the emerging levels of knowledge retention.

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 escalating amount of knowledge retention and a possible hostile attitude towards colleagues, supervisors and others alike.

Firstly, "evasive hiding" describes the concept of promising to help but never fully intending to give information different from what the person wanted. Thereby, on a superficial level, information is shared, but only to the extent of direct contact from the person requesting the information. Furthermore, only the asked-for details are shared, while upcoming information is purposefully held back.

On a second level, "playing dumb" reaches so far as developing a bias against others by denying facts, know-how and other crucial information by claiming ignorance. This attitude leads to either delayed progress due to the lack of knowledge of other team members or completely missing out on insights crucial to the performance of the whole team (Connelly et al. 2012).

Lastly, "rationalized hiding" is defined by the highest ratio of sinister intentions, going so far as to justify the retention of knowledge by blaming both members in the team as well as third parties and thereby legitimizing the lower performance of oneself. Suggesting that oneself is unable to provide knowledge due to the "apparent" failure of others and similar actions serves the purpose of overshadowing the intentions of high-level knowledge retention (Connelly et al. 2012).

Throughout all these levels of knowledge hiding, the level of narcissism or hostility against others in a knowledgeable individual determines the actual behavior of that individual, allowing knowledge hiding to change dynamically depending on changing managerial environments (Boz Semerci 2019). These factors have a thorough influence on the climate inside the team, and, essentially, the performance of multiple individuals are grouped to solve a common issue.

Thus, the scale of the climate needs to be evaluated, commonly referring to *competition* on the one side and *cooperation* on the other. Commonly, in traditional teams, these two sides seem to exclude each other, as individual parties either band together and overcome difficulties or resort to hostile actions, meaning that projects become stalemates or are cancelled altogether. Cross-functional teams, however, serve different purposes. They intend combining single experts and decisionmakers without their team's direct support into working groups, limiting their mission and purpose to strict deadlines—all without previous contact or exchange. Further mutual support is not taken into consideration, as most of the time these individuals face different strategic, organizational and managerial mindsets, and their wishes and regulations and sometimes even include outside members,

namely suppliers or customers. This leads different heads of department competing and cooperating at the same time, as different disciplines, authorities and reporting organs interfere in finding a consensus, while still offering, however, higher levels of efficiency than traditional team settings (Ambrose et al. 2018).

This limbo state between shared cooperation and hostile competition leads to *coopetition*, describing the competitive environment in cross-functional teams that is created by the power balance between the need to cooperate to reach certain goals while balancing (or rather competing with) target goals of financial or performance origin, both dictated by their own department or supervisor. The careful adaptation of coopetition holds a great significance for the success rate of cross-functional teams as it directly influences the dynamics of interpersonal behavior and thereby impacts the willingness of knowledge sharing. Personal goals such as maximizing personal benefit directly collide with the concept of teamwork, as members of said team need to reach 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 rising complexity of modern, ever-changing business situations, the concept of single individual-based solutions become more and more rare. The need to evaluate individual competitiveness among the team members of cross-functional teams is crucial, as factors increasing said attitude can lead to the different knowledge-retention methods mentioned above and thereby harm the efficiency of the whole enterprise.

In the following, the study will focus on the following types of competitive antecedents leading to increased individual competitiveness: the competitive personality, the influence of the competitive supervisor and individual competitiveness.

Before the analysis, it is important to point out that companies tend to assign coordination tasks that deal with simultaneous managerial, legal and financial contradictions to upper hierarchical levels (Ambos et al. 2008; Andriopoulos and Lewis 2010), as these positions tend to have both higher knowledge qualification as well as leadership capabilities regarding leadership from a top-down perspective. These contradictory tasks include the division between cooperation and competition, also called coopetition capability. Building up an organizational structure focused on employees with high coopetition capability can reduce tensions within cross-functional teams when coordinated and led by a higher hierarchy (Bengtsson et al. 2016). Having both the direct connection to their subordinates via (in)formal communication channels and the insights of the bigger picture of the management board, these key hierarchical positions can effectively decrease the competition within cross-functional teams by allocating resources to each individual at the necessary amount (Eisenhardt et al. 2010; He and Wong 2004).

During this paper, it is assumed that competition within a team is the main driver of conflicts and thereby leads to knowledge hiding. Consequently, the following hypothesis is proposed:

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

To further decipher the cause and measurement of competition this paper dives into the different concepts of individual personality evaluation. Causal factors for the competitive behavior of team members could be the environment and the personality of the individual themselves. In the field of personality research, there is a wide variety of models for analyzing the character of an individual, however the core analysis is similar. The personality of individuals is assessed through the five main dimensions of Extraversion, Conscientiousness, Neuroticism, Agreeableness and Openness; this is considered the universal standard model of personality research. The main difference lies in the emphases, as the HEXACO model additionally assesses Honesty-Humility and Emotionality, while the NEO PI-R has six subcategories for each main dimension in addition to the five main dimensions (Costa and McCrae 2008).

Some models, like the one presented in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), put additional focus on the development and establishment

of maladaptive personalities, reaching so far as identifying personality disorders. The model integrates a personality inventory, the so-called PID-5, including insights into the dimensions of Negative Affectivity, Detachment, Disinhibition, Psychoticism and Antagonism (Thimm et al. 2016) These dimensions are arranged on a rising scale, meaning that high amounts of negative affectivity will inevitably lead to the next dimension. The basis of this personality dimension is also the assumption of a continuum between healthy and psychotic. Negative affectivity is characterized by direct action-reaction effects and involves the experience of negative emotions (Watson and Clark 1984). These include but are not limited to anger, contempt, nervousness or fear. Emotions might be temporary, but they shape future interactions between individuals. Individuals in this phase are either unable to connect with others on an emotional level or avoid certain situations that might trigger anxiety, resulting in possible detachment or further evasion from other emotional connections. Disinhibition reaches one level further and can be described as the lack of restraint manifested in a disregard for social conventions, impulsivity and poor risk assessment (Joyner et al. 2021). Current authority is questioned, and legal and social norms are purposely ignored. Due to the sheer emotional instability of the individual, decision-making is no longer rational and is based on vivid actionism. Direct action is needed to resolve this situation, as otherwise individuals resort to the final level: "psychoticism". Characteristics belonging to psychoticism are aggressiveness, callousness, egocentricity, impulsivity, creativity and antisociality. The direct contact between individuals has come to a full halt, and chaos among staff has become the rule rather than the exception. At this stage, a successful, reasonable work in a team is no longer existent, and primal attributes such as "might makes right" become dominant. High fluctuations of staff and constant interventions from higher-ups cause a chain reaction, allowing no quick return to the status quo.

Antagonism being the most extreme occurrence of the mentioned model, it is deemed to be one of the factors with the highest possible measurability. Additionally, being one of the main factors of the five-factor model of personality in terms of openness and agreeableness in arguments (Crego and Widiger 2015), it was deemed as the most defining variable to describe the readiness for knowledge sharing. This is further supported by past research, where antagonism was evaluated as the one of the highest factors influencing openness to new experiences under the condition of conscious leadership (Amirazodi and Amirazodi 2011).

Looking at the current research, it becomes evident that all these characteristics, especially antagonism, range on a scale; all former studies reassure that this personality trait can be captured by items in a stable and independent manner. Antagonistic individuals are crucial for the evaluation of competition among cross-functional teams, as they tend to be competitive rather than cooperative (Costa and McCrae 2008). Including traits such as manipulativeness, cunning, narcissism and callousness (Widiger and Oltmanns 2019), these so-called dark personality traits show positive correlations with career success (Spurk et al. 2016). More 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). Based on studies showing that antagonism is often related to competition and career success, we further hypothesize the following:

Hypothesis 2 (H2). *Individuals who have a high expression of antagonism are more individually competitive.*

On the level of corporations, however, no decision is made alone. At the level of the individual's environment, the bottom-up view, meaning the individual's supervisor, has a great influence on its behavior and performance. Independent from the position of the individual, the leadership competence of their superior is decisive over the efficiency of the subordinates. Misjudgments of the correct amount of external responsibility and delegation

from higher-ups leads directly to discontent and thereby hostility towards the upper management. Missing acknowledgment and an unclear organizational or authoritative relationship thereby deeply interrupt the workflow of employees.

Leadership therefore clearly has an effect on coopetition among cross-functional teams, either fostering harmony between the members or destabilizing it. Insights from the current research argue that considerate and participative leadership in particular has a positive effect on coopetition, while centralized leadership has a strong negative effect on coopetition (Strese et al. 2016). If a centralized decision-making authority outweighs the participative coopetition ability by a certain degree, team decision-making and communication will be inhibited (Strese et al. 2016; Tsai 2002). This leads directly to the obstruction of knowledge sharing, which in turn reduces collaborative capacity.

Other studies examined an individual's adaptation with the role of the supervisor. Besides the discussed organizational and leadership responsibility, supervisors also fulfill a moral responsibility to be a reasonable role model in their organization. Individuals orient themselves very specifically in their behavior both to the example of their own supervisor and to the behavior of the business or company management. This method and the boundaries of said orientation are, evidently, individually developed by the individual. The behavior of the leaders 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, competitive behavior in a leader would also lead to their team members behaving accordingly. This leads to the following hypothesis:

Hypothesis 3 (H3). *Individuals who have a competitive supervisor are more individually competitive.*

Combining the three hypotheses, the model was created to depict the proposed factors leading to knowledge hiding (see Figure 1).

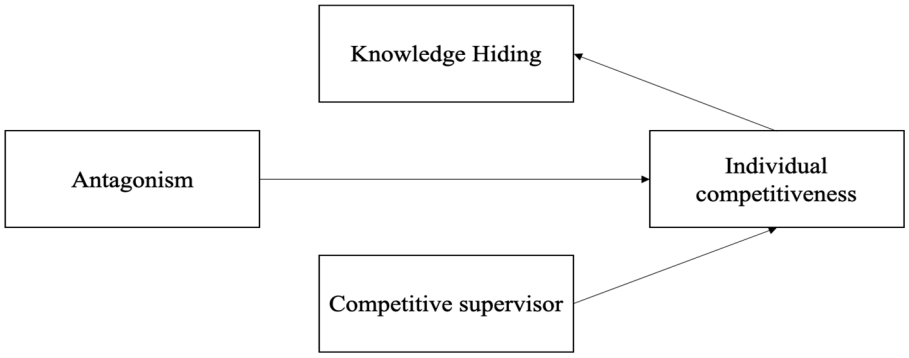

Figure 1. Conceptual model.

2. Materials and Methods

2.1. Material

This paper measures, through different scales, the different impact factors of individual competitiveness that result in knowledge hiding, which are mainly personal antagonism and the behavior of a competitive supervisor towards a rising individual competitiveness.

Firstly, a short literature review was conducted, defining the measurement factors researchers have used previously in intra-organizational network-like contexts. The models were organized by an amending of 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). To measure the competitiveness of the supervisor, the scale of Brown et al. (1998) was used, and a similar structure was applied to formulate the items on the questionnaire. Similar to the scale of Brown et al. (1998), the

items were clustered as a dimension of psychological climate on self-set goal levels. This dimension is in line with the research question to determine the competitive supervisor.

Secondly, to measure the personality traits of individuals, the items of the personality inventory for DSM-5 of Maples et al. (2015) were applied. Items that predicted antagonism were further described, particularly the personality trait factors of deceitfulness, grandiosity and manipulativeness (Maples et al. 2015). These items are also indisputably listed by other researchers as explanatory variables for antagonism.

Thirdly, the widely applied scales of Connelly et al. (2012) were chosen to measure knowledge hiding. The second-order construct of knowledge hiding subsumes three latent constructs, namely evasive hiding, playing dumb and rationalized hiding. All response options were measured on a bipolar, eleven-point rating scale, from 0 (strongly disagree) to +11 (strongly agree).

Only the level of interpersonal behavior towards the organization was included (e.g., identifying the effects on certain individuals and their resulting actions leading to knowledge hiding antagonism, relationship to their supervisor), while the concepts of organization levels as a whole were purposefully discarded. Organizational concepts present in businesses vary not just between the industries themselves (product or service portfolio, customer demands and fluctuation, technological development, ecological and social regulations by lawmakers and external effects like pandemics) but also between units inside the same organizational complex. These concepts may imply visible or obvious rulesets, but also hidden or missing factors of culture, ethics and unspoken rules. Therefore, we refrained from including organization-dependent assumptions, which could possibly have falsified our results, and we thereby eliminated a potential disrupting factor in our questionnaire.

2.2. Procedure

To empirically investigate the conceptual model, and to test the hypotheses, a survey targeting cross-functional teams was conducted. The respondents were asked to complete a structured questionnaire containing 31 questions using metric scales (see Appendix A). The survey was publicly available on SoSciSurvey.com to collect the data. All participants took part in the study in the time frame between 21st of October and the 24th of November 2021.

Since the study used data based on self-reports, another important task was to consider the issue of common method bias (CMB). First, CMB was avoided upfront by taking into consideration the notions of Podsakoff et al. (2003, 2012) when designing the questionnaire. In terms of the structure of the research instrument, questions were clearly separated; those related to the dependent constructs were asked prior to those related to the independent ones. Only one rating scale was applied throughout the questionnaire. Further, the specific purpose of our project was not revealed, in order to prevent the falsification of results, and the respondents' confidentiality was assured. The items were additionally rotated within the study to avoid primacy and recency effects (Deese and Kaufman 1957) and order bias (Blankenship 1942). There was no time limit for giving an answer.

For the study, only a limited amount of social science related basic data was gathered, namely, age and gender. Multiple other generic factors, such as experience, level of education and job position, were discarded, as this dataset was purely addressing employees already familiar with the concept of cross-functional teams. These teams only take place in higher management circles, as department chiefs, external advisors and specialists alike are assembled to tackle certain critical issues. This creates an environment with high heterogenous knowledge distribution, meaning high levels of education and at least a decade of gathered applied skillsets. As a result, it was not deemed necessary to further evaluate this information. Furthermore, the study was concentrated on a Central European workforce, allowing harmonized education and, to a great extent, cultural backgrounds.

2.3. Structural Equation Model

The structural equation modeling (SEM) in Stata 14.0 was applied to the results to test the hypothesized model. All analyses used a covariance matrix as input and a maximum-likelihood estimation. Beginning the estimation of a measurement model for the scales, paths were later added to the measurement model to test the hypothesized relationships.

3. Results

The descriptive statistics for the major variables of interest in the study are provided in Table 1. In general, the proposed model was supported by the zero-order correlations. Antagonism was significantly correlated with individual competitiveness, knowledge hiding and competitive supervision (r = 0.34, $p < 0.01$, r = 0.64, $p < 0.01$, r = 0.39, $p < 0.01$). Further, correlation between competitive supervision 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 competition (r = 0.19, $p < 0.05$).

Table 1. Means, standard deviations, latent variable intercorrelations and Cronbach's α.

	Variable	M	SD	1	2	3	4	Cronbach's α
1	Antagonism	3.82	2.22	1				0.95
2	Individual competition	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 = 129 ** $p < 0.01$, * $p < 0.05$.

3.1. Model Fit Value

The comparative fit index (CFI) (Bentler 1990), the Tucker-Lewis index (TLI) (Bentler and Bonett 1980), the root mean squared error of approximation (RSMEA) with confidence intervals and the standardized root mean square residual (SRMR) were used.

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, which had the largest covariances, the model subsequently converged. With the help of a third structural path, the fit indices were good enough for the model (see Table 2).

Table 2. Improvement of confirmatory factor analysis by adding structural paths.

Model	Description	χ^2	CFI	TLI	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 *	Hypothesized model	210.17	0.85	0.81	0.19	0.14

* only 10 iterations due to no convergence.

3.2. Hypothesis Testing

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 2, H1 is rejected, as individuals with high competitiveness were significantly negatively correlated to knowledge hiding. H2 is supported, as individuals with antagonistic personality traits were significantly positively correlated with knowledge hiding. H3 was rejected, as having a competitive supervisor is positively correlated with individual competitiveness, but not significantly.

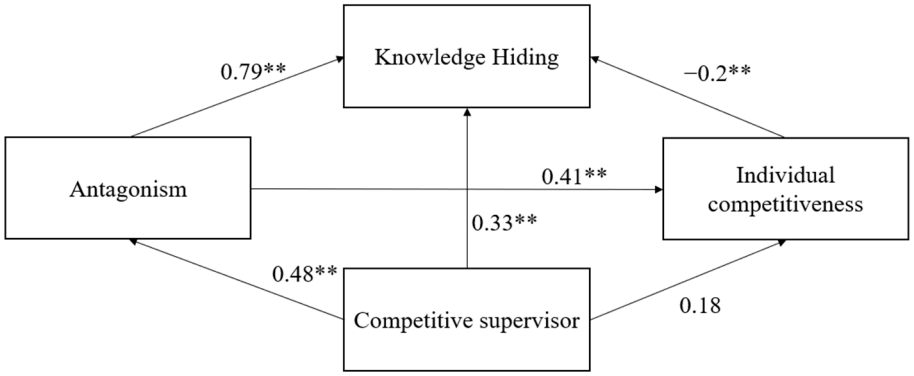

Figure 2. Standardized path loads. Notes: ** $p < 0.01$.

As the model fit was improved by structural paths, further significant correlations emerged within the model. Individuals with a competitive superior correlate positively with antagonism and knowledge hiding. Antagonism also positively relates to knowledge hiding.

4. Discussion

So far, this paper has summarized the current knowledge and personality evaluation of the psychological effects of participants working in cross-functional teams. By using a personalized questionnaire similar to previous research, the aim was to explain links to behavior regarding knowledge hiding in the respondents. Three main factors were deducted and collected: first, the antagonistic personality; second, the external circumstances, such as competitive leader; lastly, the competitive behaviors of each respondent. All these factors were put into relation to identify the statistical connection between the factors and thereby extract implications for the successful implementation of cross-functional teams.

4.1. Theoretical Implications

Consistent with previous findings, the results of the current study show that antagonism displays a high positively related correlation with individual competitiveness (H2). Antagonism is a very controversial personality trait, as in most cases it is not visibly presented by the respondents. Linked with several negative aspects such as malicious divergent thinking (Lee and Dow 2011), deceitfulness and manipulativeness (Maples et al. 2015), most respondents, even in anonymous situations, would not openly reveal their honest intentions and rather obscure their antagonism, even in written form. This can be traced back to the fact that open hostility towards the status quo can be evaluated as unprofessional behavior or as a direct attack on supervisors, leading to disciplinary actions or the instant dismissal of the employee. Instead, superficially hidden, so-called counterproductive workplace behaviors (CWBs) are used by the antagonistic individual. They manifest in actions that cannot be directly measured but rather constantly undermine the authority and the cooperative work ethic inside teams. Therefore, antagonistic individuals cannot be held (directly) responsible while still being detrimental to their work environment and structure (Robinson and Bennett 1995). Typical actions include intentionally reduced working speed, rudeness in the workplace or non-traceable activities such as targeted theft or property damage. Studies have shown that antagonism positively correlates with CWBs (Berry et al. 2007); it is therefore reasonable to assume that antagonistic team members are more likely to act competitively and thus counterproductively in cross-functional teams.

The current findings, however, did not support the relationship between competitive individuals and knowledge hiding in cross-functional teams (H1); instead, a negative correlation was identified, implying that higher personal competitiveness leads to less knowledge hiding. Due to missing further implications, it is assumed that other factors in particular lead to knowledge retention. Hernaus et al. (2019) prove that in general, knowl-

edge retention also increases in competition, but predictors such as task interdependence and social support play a leading role. Employees' perceived distrust is also positively related to knowledge-hiding behaviour (Connelly et al. 2012). Excluding these factors reveals that in a harmonic atmosphere, individuals with higher individual competition might be able to contribute to the fact that competitive individuals are more likely to share their knowledge within the team. In a highly appreciated and cooperative environment, these individuals can encourage their direct colleagues to higher efficiency (in an optimistic scenario). However, these intentions can also be reviewed as tolerated antagonism, where individuals only support the team if they receive personal benefits (i.e., praise from supervisors, being distinguished from other colleagues etc.) and drop all efforts as soon as these individual gains are no longer sustainable.

Lastly, the correlation between competitive supervisors and individual competitiveness was not supported (H3). While past research implies such a relationship between a competitive supervisor and the subsequent adaptation of the individuals being competitive, this study suggests there is no significant relationship. Although the supervisor may have an influence on the employee, it is safe to assume that there are also other predictors that lead to whether an individual is competitive. Prominently, the personal attributes of each individual make a constant and replicable insight impossible. Due to the individual human nature, as well as their age, experiences and mentality, individuals might react differently to the competitive attitude of their supervisors. Passive and cautious personalities might even consider this type of leadership annoying or frustrating, as they want to remain in their work pace and may feel unnecessary pressure from a competitive supervisor. On the other hand, some supervisors might not have the necessary leadership and human skills to effectively motivate their employees, leading to aggressive, force-based leadership rather than cooperative and mutual complementation of skills, thereby causing peaceful and participative individuals to remain true to their cooperative intentions and refusing to adapt to the traits of others, whom they despise.

This assumption can be further proven by the two relevant findings. The statistical analysis points out that, on the one hand, having a competitive supervisor leads to antagonism. Particularly, the strong correlation of having a competitive supervisor with antagonism suggests that environment has a deep influence on personality and behavior in teams. As mentioned before, this is to be expected if the competitive supervisor lacks the skills to combine supporting leadership and mentoring with a performance orientation. On the other hand, antagonism itself is the main driver for knowledge hiding, resulting in reduced efficiency in cross-functional teams.

4.2. Practical Implications

Given 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 retention.

While very competitive behavior in an individual does not itself lead directly to knowledge retention, the personal behavior of an individual can be influenced thereby. Therefore, it is deduced that requirements for leadership techniques and a common work atmosphere are of higher importance than additional (forced) competition among team members. The danger of increasing hostility among team members can cause disastrous short- to long-term effects on the whole organizational structure, while providing minimal to no advantages. Leaders should focus on giving full support to their employees who work in cross-functional teams, in addition to their anchor department, to enable collaborative working. By harmonizing operational factors such as harmonized communication channels, use of tools and techniques and clear and sufficient responsibilities among the team, antagonistic behavior can be reduced to a minimum. Adapted evaluation concepts and the promotion of individual problem solutions inside the team help establish a common mission and value proposition, dampening the drive for narcissistic behavior while simultaneously rewarding individuals for increasing their efforts towards the success of the whole team.

If every team member feels valued and respected equally, collaboration on the basis of shared respect and professionalism can override a strict focus on individual goals and find a solution that provides more benefit to everyone, rather than just a few. Therefore, it is expected that, especially in project teams where the goals of the anchor department and the project teams are conflicting, collaborative supervisors lead to less knowledge hiding.

The second practical implication is that antagonistic personality traits lead to individual competition and knowledge hiding. It is proposed that regular measures for personality development can reduce knowledge hiding. Advised measures would be regular face-to-face talks inside the team to detect and discuss urgent matters and find a fitting solution for everyone. Additionally, measures should be taken that allow criticism and constructive critique from the outside, as traditional top-down leadership could prohibit all individual opinions from questioning the status quo, leading to a toxic and hostile environment.

4.3. Research Limitations and Future Research Suggestions

Despite the many contributions of this research, some limitations must be acknowledged. Firstly, the limitations of the methodology are discussed. For the evaluation of the study, only participants in Europe were considered. Due to the significant differences of autonomy, culture, industrial standards and leadership structures between geographic locations, these results only depict the situation in the predefined environment; studies in other regions might have highly distinctive results. A regional bias cannot be safely excluded. Furthermore, this study did not concentrate on a single industrial sector and represents a wide industry cross-section.

Additionally, not all levels of short-term coopetition-influencing factors were considered. Most prominently, the duality between orientation towards team goals vs orientation towards individual goals plays a significant role in the short-term scope of the action of all cross-functional team members. Only through external respect towards individual goals and an internal readiness to limit individual expectations towards a successful team goal without immediate profit can the success of these projects be guaranteed.

Depending on the necessary creative tolerance in certain sectors (such as marketing, communication or project management, as compared to strict manufacturing or sales environments) cooperation is much better anticipated by each member inside a team than in other sectors. A need for individually tailored and adapted leadership methods is crucial; standardized measures that work all the time are not applicable.

During the research, the following three side findings could be defined:

1. Individuals who have a competitive supervisor are more antagonistic.
2. Individuals who have a competitive supervisor hide knowledge more often.
3. Individuals who are highly antagonistic hide knowledge more often.

These findings resulted from the statistical equations of factors that were not direct aims of investigation but were discovered while investigating the quality of the applied model.

While further knowledge was generated on the topic of coopetition in previous business areas (Crick and Crick 2020), additional empirical research should be focused on other social science-related factors affecting knowledge retention that were not taken into consideration in this study.

This includes, but is not limited to

Research Question 1:

As the adoption of cross-functional teams in business-related terms increases, how do the strategic decision makers ensure the integrity of their organizational structures and regulations?

Research Question 2:

Balancing the interests of participants in cross-functional teams: How are team goals and individual goals related and pursued by each team member?

Research Question 3:

The essence of education models is present in both groups of heterogenous and homogeneous knowledge diversification. How differently does organizational behavior affect the willingness of group members towards synergy?

Research Question 4:

What factors negate the strong positive correlation of antagonism towards individual competitiveness and knowledge retention when the latter negatively correlates with knowledge retention?

Additionally, changes to 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 results evaluated in this study?

Research Question 6:

How do changing surroundings, namely, external disruptive factors such as pandemics and digital work, affect the efficiency and the daily processes of cross-functional teams regarding knowledge distribution?

Hence, it is advisable to direct future research towards the analysis of further knowledge retention affecting internal (employee satisfaction outside of cross-functional teams, employee participation in strategic decision-making, etc.) and external (enterprise innovation dangers, global financial developments, pandemics) reasons.

5. Conclusions

The aim of this paper was the analysis of factors hindering efficient task solving in cross-functional teams by statistically examining direct causal effects on the issue of knowledge retention. Firstly, the different stages of the purposeful retainment of information and knowledge were presented. During the literature review, it became evident that multiple factors, mainly antagonistic behavior, the competitive behavior of supervisors and the competitive behavior of someone's self, might be relevant factors leading to conscious knowledge retention. Therefore, three main hypotheses were formulated. By conducting a questionnaire that included items derived the latest insights into antagonistic behavior, the following core results could be defined:

Knowledge hiding is one of the highest danger potentials for the efficiency of cross-functional teams. Antagonism seriously threatens the willingness of individuals to share knowledge. The competitive behavior of higher-ups affects the development of antagonism in both a positive and a negative way, although negative experiences are much more dominant, thereby also influencing knowledge retention. Individual competitiveness does not clearly affect the share of knowledge inside the team; however, based on assumptions, it offers a highly volatile influence on it.

Finally, it was deduced that the reasons for knowledge retention are not singular, but are rather a complex mixture of the aforementioned leadership traits and organizational and workplace related rules and regulations. Each individual, based on their moral concepts and past experiences, resorts to antagonistic behavior due to different disruptive factors, which have to be reduced in order to promote successful cross-functional team-based work.

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Appendix A. Structured Questionnaire

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							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							

Classification		Items	11 Point Likert Scale (0 = I Don't Agree; 11 = I Fully Agree						Source
			0	**2**	. . .	. . .	**10**	**11**	
	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							

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