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Faculty of Business Economics

Master of Management

Master's thesis

Successful inventions in teams: The knowledge of team members, team composition, team experience and team diversity

Sam Valvekens

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization Strategy and Innovation Management

SUPERVISOR :

dr. Relinde COLEN



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Disclaimer

This master thesis was written during the COVID-19 crisis in 2020-2021. This global health crisis might have had an impact on the process, the research activities and the research results that are at the basis of this thesis.

Preface

You are currently reading the master's thesis 'Successful inventions in teams: the knowledge of team members, team composition, team experience ,and team diversity'. The research for this master's thesis was carried out using a quantitative study using the data obtained from the publications of 253 authors. This thesis was written in the context of my graduation from the Master of Management: Strategy and Innovation Management program at Hasselt University.

Together with my supervisor, Linde Colen, the research was completely set up and after an extensive quantitative study, the research question was answered. During this research, Linde Colen, was ready to answer my questions which allowed me to continue my research.

I would like to thank her for her guidance and support during this process.

Finally, I would like to thank my parents. Motivating and wise words have helped me bring this master's thesis to a successful conclusion.

I wish you much reading pleasure.

Sam Valvekens

Neerpelt, 2021

Abstract

Managers today have the important task of putting together teams that will work together on new projects. For the project to have a positive outcome, the team must consist of the right chosen team members.

This research aims to find out how to build a team that will lead to success, with knowledge, experience, diversity, and psychological safety being the parameters of the team.

In order to answer the research question, a quantitative data study was conducted based on the publications of 10 scientists in the specific field of management sciences during the period 2005-2015. Based on this publication level data of teams, regression analysis showed that it is better to put together authors who have less experience in working in teams, have obtained more citations on their previous publications ,and have been professionally active for a longer time. It is helpful if the authors have a basic knowledge of the subject in which the team will work and that the authors have a high individual knowledge in topics in which they are strong and preferably that the knowledge among the authors differs so that there is diversity in knowledge. If a team is to be put together, psychological safety must be taken into account. If one chooses authors who have been professionally active for a shorter period of time, it is better if these persons have worked together on previous publications.

Executive summary

The result a team delivers depends on its team members. Look at group assignments, where cooperation and drive are crucial to successfully complete a task. This is not different from a research team striving for innovations or inventions. Managers of companies therefore often have the important task of putting together a team of people that works together on a project. This happens because a team is more successful than an individual working on the same project (Singh & Fleming, 2010).

The aim of this research is to find out how to build a team that will lead to success, with knowledge, experience, diversity, team composition and psychological safety being the parameters of the team.

To answer the research question, a quantitative data study was conducted based on authors' publications which were collected via Web of Science. The aim is to observe the team activity of 10 scientists in the specific field of management sciences. The team activity of these scientists is observed by an examination of their 221 co-authored publications during the period 2005-2015. To capture the characteristic of every team member on these 221 team publications, all the publications of in total 253 authors were gathered. Based on this author-level data, the team characteristics could be determined. Finally, a data analysis of the 221 team publications is used to examine whether team performance, measured by number of citations received by the publication, can be explained by characteristics of the team.

In order to understand and better reflect the team characteristics, a theoretical background must first be established. According to the literature review, knowledge diversity helps to come up with new ideas and useful connections, to make team members look at problems differently (Bilalić et al., 2008; Verhoeven, 2020). Experience is seen as the knowledge that an individual has about a certain subject, which this person has experienced himself (Littlepage et al., 1997). From experience it goes on to familiarity and according to Goodman & Leyden (1991) and Staats (2011), team members who work together regularly build a social base and are therefore able to coordinate task-related actions. This means that when a group of individuals have worked together, this group may perform better than a group that has the same amount of knowledge and experience, but has never worked together (Harisson et al., 2003; Huckman & Staats, 2011).

The study resulted in some interesting findings. First, it seems better to put authors in a team who, on average, have less experience in working in a team. Second, it is visible that it is better to work with authors who are on average more experienced: they have obtained more citations on their previous publications, they are professionally active for a longer time. Third, knowledge of an author, which is investigated by the number of times a keyword recurs in a team publication, shows that it is better to work with an author who on average has more recurring keywords in team publications. Finally, the results indicate that it is better to have more knowledge diversity in a team. It is also better to have a team of which authors have a minimum knowledge of a certain subject in order to get more citations on the next team publication.

After knowledge came the research of team familiarity, which is the average number of times that each member has worked with other members of the team and identify themselves to be familiar with each other based on the work experience they share (Huckman, Staats & Upton, 2009; Staats, 2011). And that can be seen as psychological safety in a team. The first result here is that it is better to work with authors who have already worked together on a publication together. This means that the authors are familiar with each other. Second, when one works with authors who have a lot of team working experience, which means that these authors have experience in working in a team, it is better to put together a team that has worked less with each other in the past, so has less familiarity. If one has a team where authors have worked together more in the past, a high familiarity, then it is better to choose authors who have less experience in working in a team. The same applies to authors who have been professionally active for some time. If you have a team where authors have been professionally active for a long time, it is better to choose a team with less familiarity, meaning that they have worked less with each other in order to obtain more citations on the next team publication.

When the issues described here are taken into account by those who manage the composition of a team, more positive results may be achieved because there is now more understanding and clarity about what a team mainly consists of. When a person needs to put together a team, he or she can take the following points into account. It is better to put together authors who have less experience in working in teams, have obtained more citations on their previous publications and have been professionally active for a longer time. It is helpful when the authors have a basic knowledge of the subject in which the team will work and that the authors have a high individual knowledge in topics in which they are strong and preferably that the knowledge among the authors differs, so that there is diversity in knowledge. When a team is put together, psychological safety must be taken into account. If one chooses authors who have been professionally active for a shorter period of time, it is better if these persons have worked together on previous publications.

A major limitation has been time during this research. Because the data had to be collected manually, the sample of authors is relatively small and could not be increased within the time frame for this thesis. This may result in less significant results in the study.

For a follow-up study, it is recommended to collect more data from publications, therefore more author data, and to include them in the study. What also might be interesting for a future research is to look at more variables related to a team. This study looks at the experience that authors have working in a team. Here can be looked at what an ideal number of people is, to put together a team. The study also looks at the background knowledge of the authors. Other backgrounds of the authors, such as, origin, study and culture also have an impact on a team according to the literature. This could be investigated in the future in order to create a better picture of a successful team.

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1. Introduction

The result a team delivers depends on its team members. Look at group assignments, where cooperation and drive are crucial to bring a work to successful completion. This is not different from a research team striving for innovations or inventions. Managers of companies therefore often have the important task of putting together a team of people that works together on a project. This happens because a team is more successful than an individual working on the same project (Singh & Fleming, 2010).

This research will show what the characteristics of a successful team are and why it is useful to choose a particular team when striving for innovation. There are several reasons to choose a team to lead a project instead of an individual. Inventing innovations is possible on one's own two feet, but the research of Singh & Fleming (2010) has indicated that individuals have less successful innovations than teams (Singh & Fleming, 2010). A team possesses more knowledge and therefore has a different way of solving problems, has more creativity (Singh & Fleming, 2010; Somech & Drach-Zahavy, 2013) and the productivity of a team is higher if the cooperation is positive (Somech & Drach-Zahavy, 2013). In fact, a team made up of members from diverse backgrounds may be up to 35% more creative compared to other teams (Rock & Grant, 2016). When productivity is higher, it also means that less time will be needed to develop a product or innovation (Bueters, 2020). In order to achieve goals and effective results, it is helpful to have good communication in the team. Good communication also includes honesty and respect and comes together with psychological safety. Team members must be able to give their input without making others or themselves feel uncomfortable. It is, therefore, a good idea to check whether the individual has ever worked together in a team and what the results were. According to Miller (2018) there is proof that a team can work together effectively and achieve results, especially when a team has already worked together, this can lead to fewer personal conflicts. In this way, the familiarity of a team can be seen, and one knows whether certain persons fit into a team or not.

To fully understand these characteristics of a team, a literature review is conducted to gain deeper knowledge on various topics related to teams and the individual who will participate in a team. There have been many studies on teams but it is still difficult to find out which factors are most important to create a successful team. In order to better understand which factors are relevant to create such a successful team, a quantitative study is conducted using publication data, which was then processed with the statistical program Stata. Based on the data, an answer is sought to the main question of how to compose a successful team. Therefore, this study will focus on the sub-questions, whether a team member must have extensive knowledge of certain subjects when placed in a team, whether an individual experience is important in a team, and what psychological safety does in a team.

The next chapter of this thesis provides an overview of the literature collected on the subject. It then goes on to discuss the research method and how the data is processed. Then chapter 4

describes the quantitative data analysis and its results. And finally, the discussion and conclusion are presented.

2. Literature review

2.1 Why teams?

Good teamwork is essential for excellent performance, this is because they are working towards a common goal and sharing their different skills (Salas et al., 2017; Salas, McDaniel, & Reyes, 2018). Teams are everywhere in our lives (in schools, hospitals, the army, factories, research centres, etc.). The population of teams in organisations has increased considerably over the last ten years (Naquin & Tynan, 2003). Teams are used by organisations to carry out tasks but also to conduct research. They belong to the structure of that particular institution (Donnellon, 1995; Naquin & Tynan, 2003). Teamwork is seen as the best way to achieve high performance due to the individuals who work together towards a common goal (Katzenbach & Smith, 1992).

According to studies, working in a team increases innovative ideas and projects (Singh & Fleming, 2010; Somech & Drach-Zahavy, 2013). For example, a single or independent inventor has a lower probability of creating novel breakthroughs (Gaudry, 2012; Ljungberg, 2019; Singh & Fleming, 2010). According to Singh and Fleming (2010) "a lone inventor is socially isolated and either does not work with coinventors in a team, does not work for an organization, or both" (p.42). An individual may make his own work, but his influence on that idea or work will rather be limited. Since the researcher has only one angle to look at, which is his own angle, there will not be a critical view. When several people are working on an investigation, there are several ways of looking at something and build on their ideas and knowledge. When an individual inventor makes or comes up with something, he will test it right away. This is because he has one idea, and the inventor is going to stick to that idea. At this stage, when something failed or did not go as it should go, he immediately thinks about points for improvement but then throws other ideas, which could be better, out of the bus. An individual is therefore not the best evaluator of his own invention (Singh & Fleming, 2010).

This is because he cannot get feedback from other people and therefore cannot look at his own creation from a different perspective. Teams have a better view on this by a reason of that they look at it from different angles and perspectives. Considering the diversity in a team is also greater, it may be that a team member has already seen the same problem with an idea in another project. To work together in this way a lot of problems can be solved quickly. There is less chance of tunnel vision (Singh & Fleming, 2010). Tunnel vision ensures that the bigger picture is not seen. An individual can have an idea in mind and completely ignore or push aside all other people's ideas. This causes that a person only focuses on one idea. Anything that provides additional information for that specific idea or outcome will be included. But the other sources of information that may also be helpful but are not specific to that idea will be ignored (Decker & Mitchell, 2016).

Although organisations have found that teams are more effective than individuals, companies still need to watch out for common pitfalls in unsuccessful teams (Singh & Fleming, 2010). Common pitfalls are that there is not a good team dynamic or poor management whereby work can be less efficient (Singh & Fleming, 2010), there is a lack of coordination and communication (Salas,

McDaniel, & Reyes, 2018). The size of the team also plays an important role. Team size, large or small, is often looked at to find out how the team functions (Hoegl, 2005). Team culture and the knowledge within the team, are also factors that affect the team members. A good leader and psychological safety can ensure that a team is properly monitored and can work together efficiently (Mike Cardus, 2013).

Organisations make the switch to teams more often, but teams are also changing. They are becoming inter-professional, more diverse and cross-cultural. Teams can differ in their skills varieties, life experiences, work experiences, whether the team interacts virtually or face-to-face, the ranking of authority and team size, play a role in the uniqueness of a team (Hoegl, 2005; Salas, McDaniel, & Reyes, 2018). That is why it is also difficult to dissect an effective team and to find out why this team is so effective. It is important to look at the team as a whole and the context around it, the overall picture as is sometimes said (Salas, McDaniel, & Reyes, 2018).

As can be seen, teams are interesting to investigate further to find out exactly which composition of people belong together and why. It can be deduced that this is certainly not easy and that certain things need to be considered before the composition takes place. And once the team has been put together it is absolutely important to keep the team motivated (Donnellon, 1995; Salas, McDaniel, & Reyes, 2018).

2.2 Team effectiveness

In order to ensure that teams work as effectively as possible, it is important to look at the difficult phases of the development of a project (Raue, Tang, Weiland, et al., 2013). Teams need a clear role when working on a project. This ensures that there is a distinct understanding between the tasks and the goals that need to be achieved (van der Haar et al., 2017). Without a clear structure on how everything is going to be done to achieve the goal, team members may be overwhelmed by the amount of information (Edmondson & Schein, 2012). Teams are complex and can encounter problems that prevent them from operating at their best, so to see how a team works and find pain points within the team, one can use the GRPI model that can describe the team effectiveness. This model consists of goals, roles, processes, and interpersonal relationships. The GRPI model was introduced by Beckhard in 1972 and shows different aspects within a team through identifying goals, clarifying roles, the processes, and the relationships within the team (Carlock, 2012; Raue, Tang, Weiland, et al., 2013).

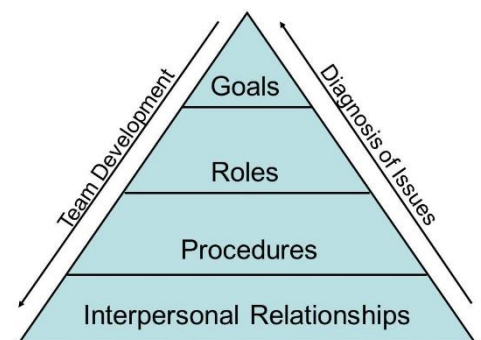


Figure 1: GRPI Model

The GRPI model represents a perspective of leadership and planning. The model puts the focus on the leader and the team so that they can optimise their behaviour and improve the quality of their performance based on effectiveness, productivity, and efficiency (Carlock, 2012). The pyramid (Figure 1) is arranged so that what is most important is at the top and works its way down.

A team must have a goal in mind, this is the highest priority of the model, by reason of a goal sets the direction and the method of working together (Carlock, 2012). It may be challenging to set a goal in the beginning and to motivate each team member to reach this goal, but it is necessary for the foundation. If there are conflicts, then it is possible that team members do not agree with each other, and this is then often focused on the relationship between the members. When this is the case, most of the time the team does not fully understand the final goal and thus misinform each other, causing confusion and conflict (Raue, Tang, Weiland, et al., 2013). The purpose of a goal is to set a direction for the team, letting them know where they currently stand and showing what they are working towards. A shared goal with a clear vision of when and how to achieve it makes a team, a team (Duckworth, 2008).

The next step in the pyramid is roles and responsibilities. A role and a responsibility describe what a team member has to do, what is expected of this person within the team (Raue, Tang, Weiland, et al., 2013; Salas, McDaniel, & Reyes, 2018). It is not recommended to have overlapping roles for individuals because then the conflict arises, "who does what". If there are complications within the team that not everyone knows what is expected of them, the division of roles is poor (Cooke & Hilton, 2015). When team members know what is expected of them and who has what role, these individuals are more synchronised, which makes these teams more likely to succeed in achieving their goals compared to other teams that have not established clear roles and responsibilities (Defila, Di Giulio, & Scheuermann, 2006).

When the roles and responsibilities are clear for a team, then it is possible to look at the processes. The actions to be taken, decisions to be made, how to deal with conflicts, how to solve problems, all these things have a procedure that must be observed within the team (Raue, Tang, Weiland, et al., 2013). Communication can be used as an example. A team communicates all the time, and this is extremely important, but it is also crucial how this communication takes place. There are different platforms that are used to communicate, like, mail, coaching sessions and regular meetings. These types of communication give a picture of how a team is going to reach the goal and the team leader can use the information to make adjustments within the team when needed (van der Haar et al., 2017).

Relationships within the team can be seen as trust, communication styles, and how team members interact with each other (Tartell, 2016). When there is a good relationship, it will also influence the other elements in a positive sense. It helps the team to better understand roles and responsibilities, to communicate better with each other, to help each other and to make the process successful (Raue, Tang, Weiland, et al., 2013), this is reversed when there is a bad relationship in the team (Tartell, 2016).

2.3 Team composition

Team composition is a mix of characters of people in a team, in which two or more individuals work together to achieve a common goal (Hackman & Wageman, 2005). A team composition is often either homogeneous, in which all team members possess approximately the same knowledge, or heterogeneous, in which the team members have complementary knowledge (Senior & Swailes, 2004). Homogeneous teams may perform better because they have similarities in knowledge and thinking, whereas heterogeneous teams may perform better because of knowledge diversity and the inclusion of different roles within the team (Mello & Ruckes, 2006). When assembling a team, the focus is on the characteristics of the team members, heterogeneity of the team members, and the size of the team (Stewart, 2006). In this study, we will focus on the different knowledge characteristics of team members and the diversity in knowledge across team members.

Team Size

The size of the team plays a crucial role in how the team will perform in the future (Wheelan, 2009). The size of the team is determined by the goal that the team must achieve, the expectations of the team members, the roles that are assigned within the team, and how the team must cohere and communicate with each other (Nieva, Fleishman, & Rieck, 1985). In general, the question of what constitutes the ideal team is very complex because it requires looking at the specifications of the team members themselves and how they are expected to work together (Guzzo & Dickson, 1996). Chiefly, larger teams are more likely to bring complementary experiences and knowledge together which are beyond the knowledge of a single individual (Woerkom & Engen, 2009). Team members who can work well together more often deliver a successful result. This is because an idea is viewed more critically in a team than by an individual, which can lead to a more positive result and creativity (Gaudry, 2012; Ljungberg, 2019; Singh & Fleming, 2010; Woerkom & Engen, 2009).

However, it is also stated that, if the team is dependent on each other, such as relying on each other's individual knowledge, the knowledge of the team is as strong as the knowledge of all individuals together (Seo et al., 2015). In this case, it is better to work with a smaller team so that everything can be monitored accurately (Molleman & Slomp, 2006).

Knowledge in teams

When working in a team it is noticeable that there are different kinds of knowledge of different domains. The individuals that work together in a team share information and ideas with each other and communicate through emotion and feelings (Rico et al., 2008). Different types of knowledge of individuals influence the capabilities of the team as a whole. When team members have approximately the same knowledge in certain areas, they also have approximately the same mental model in mind when it comes to teamwork and task division (Dooner et al., 2008; Erich Blaise Bergiel & State, 2006; Rico et al., 2008).

When it is about knowledge regarding to a task, this is called task knowledge (Guchait et al., 2016). This is about team members understanding what the task is about and having the right knowledge for it to achieve the goal (Castellan, 2013; Guchait et al., 2016). Teamwork knowledge is the knowledge that team members have of how team members should work together to function effectively (Klimoski & Mohammed, 1994).

Through discussions, the team members let each other know their point of view and this can lead to new insights that help to create innovations (Taylor & Greve, 2006; Verhoeven, 2020). Hence, knowledge diversity helps to lead to new ideas and useful connections, this knowledge diversity also reduces the chance of mental lock-in. Because a few team members have already worked on different types of projects and have different knowledge, they look at problems differently. If a problem arises or the team must look for a solution, this is looked at from different perspectives. This way the team creates an open mindset and is less likely to get stuck in a certain way of solving difficulties (Bilalić et al., 2008; Verhoeven, 2020). In order to increase creativity within the team, task knowledge must be very well known to the team members, in order to gather more diversity of knowledge from each other (Yeol Lew & Kyung Lee, 2018).

Experience is seen as the knowledge that an individual has about a particular subject, which this person has experienced himself (Littlepage et al., 1997). In a team, there is a distinction between task experience and group experience. With task experience, it is expected to increase the ability of an individual to complete a task. With group experience, it is expected that team members can better evaluate the experience and knowledge of other group members (Littlepage et al., 1997).

When an individual has done several projects and has learned in this way how to handle certain issues in order to achieve a successful result, this person has increased his expertise. The enlargement of an individual's expertise is positive for a team as it enhances the process of reaching the goal (Woerkom & Engen, 2009). The team members who have first-hand experience, specifically the experience of something they have experienced themselves, better understand the task the team is working on, provided it is within their experience capacity (Gino et al., 2010). First-hand experience can also be seen as tacit knowledge or direct knowledge. Tacit knowledge is the knowledge that is embedded in someone's mind. This knowledge can only be gained through experience and study, it is all about the know-how. It consists of various sets of skills, insights, and intuitions that are harder to articulate in a more explicit way (Aggarwal, 2019; Collins, 2013; Smith, 2001). The advantage of this knowledge/experience is that the person in consideration brings an advantage within the team. This is because this person knows exactly what he has to accomplish at a task. After all, he has already experienced this in his previous work experiences (Verhoeven 2020). Experience can also be gained in another way, namely by passing on the knowledge of one's own experience to team members, he can then be seen as the master so that they can learn from the experience of a team member and thus better understand the tasks themselves and better coordinate activities and thus work better as a team (Gino et al., 2010).

A couple of team members may have a bigger diverse personal experience than the other team members. These members may be more adept at mapping out difficult tasks, be more accurate which gives a better viewpoint for the team (Huckman & Staats, 2011). Teams that have persons who are more personal experienced, suffer from less cognitive biases. Cognitive biases are the systematic misinterpretation of obstacles or information. This affects the making of decisions, and judgments. (Morin, 2020).

Knowledge diversity

Diversity is the differences between individuals on any characteristic that may lead to the perception that another person is different from him/herself (Van Knippenberg et al., 2004). Team diversity refers to the differences between team members on a common topic (Bui et al., 2019). In practice, diversity is mainly focused on gender, age, ethnicity, educational background and functional background (Van Knippenberg et al., 2004).

In terms of individual differences, two subjects are often focused on. Social-category differences, which include ethnicity, gender, age, religion, orientation, and physical abilities, and differences in knowledge, skills, and abilities, which include education, functional knowledge, expertise, experience, and training (Bui et al., 2019). Knowledge is something one possesses cognitively, and this can strengthen the organization (Boone & Hendriks, 2009).

Team members with different knowledge or background within the team bring added value. They use a different methodology than the other team members (Huckman & Staats, 2011). According to David Rock and Heidi Grant (2016) it is a good business decision to bring person diversity to a team. Companies that have both racial and ethnic diversity in their management are 35% higher in financial returns than average companies (Rock & Grant, 2016). These teams are also seen as more innovative and smarter. By bringing more cultural backgrounds, more knowledge into a team, the team remains at a certain creative level, creating a competitive advantage when developing innovations (Huckman & Staats, 2011; Rock & Grant, 2016; Singh & Fleming, 2010). In a diverse team, it sometimes verges on a cross-functional team. A cross-functional team is a group of people with different kinds of individual expertise that work towards a common goal (Xueming, Slotegraaf, & Xing, 2006). These team members each have a different functional background, resulting in extensive non-overlapping knowledge with different perspectives (Boone & Hendriks, 2009). When decisions need to be made, diverse teams look more carefully at the given information compared to homogeneous teams. In this way, diverse teams may make better decisions (Rock & Grant, 2016).

When there is a combination of team familiarity and team diversity, this makes a fluid team (Huckman & Staats, 2011). A fluid team is a team of individuals that regularly changes projects and switch from teams (Finger, 2014). Sometimes a fluid team is seen as unstable, this is because team members come and go during projects, which makes it difficult to create a team feeling (Bushe & Chu, 2011). Fluid teams are often seen in medical teams, aviation teams, engineers, and sales teams (Bushe & Chu, 2011). The reason why these teams are chosen more often is the same as for diversity teams because these teams contain a lot of knowledge and experience (Bushe & Chu, 2011).

In a diverse team, there are occasionally obstacles such as problems with communication, value differences, and cultural differences (Stahl et al., 2010). Deep-level diversity, also called social-category differences, focuses on the heterogeneity that occurs within individuals. This means the values, personalities, and opinions of the members. Conflicts of this nature may last longer than conflicts that are about knowledge and expertise (Kim, 2017). Even though there are differences among the individuals, there are also similarities so that the team can function as a whole. This is a challenge for the brain, it keeps it sharp and ensures that it has to be creative and come out of the old thinking pattern (Rock & Grant, 2016).

Teams that have members with different backgrounds, knowledge, and capabilities, so diverse teams, are better at eliminating group thinking (Rock & Grant, 2016). Group thinking is a psychological phenomenon in which people want to fit in with the group by pretending to agree with the same ideas and put their own opinions aside and then take over the opinion of the group without a second thought (Swaim, 2020).

Absorptive capacity and background

Absorptive capacity is the ability to recognise, process, identify and use external knowledge that comes from research or experience from the environment. In other words, it is a measure of an individualistic ability to learn (Cohen & Levinthal, 1990). The cognitive basis for an individual's absorptive capacity includes his former acquired knowledge and background diversity (Enkel et al, 2017) and this can be build up by getting more education and training whereby this will increase the person's ability to comprehend and use the new knowledge (Schmidt, 2010).

Absorptive capacity on a team basis is the ability to obtain knowledge from an external team, transform this knowledge and implement it in the innovation of the project the team is working on (Backmann et al, 2015; Enkel et al, 2017). The knowledge of the team is as strong as the knowledge of all individuals together. It is an important source of knowledge and experience that can give the team a competitive advantage. Through the knowledge gained they may be ahead of other teams (Seo et al., 2015). To obtain the knowledge, regular cooperation is expected between the team that has the knowledge and the team that wants to acquire the knowledge (Backmann et al., 2015). This knowledge can be gained by team members establishing close contact with the external team. This can be done, for example, by attending face-to-face meetings or having discussions. In some cases, there is the opportunity to obtain tacit knowledge (Backmann et al., 2015; Griffith & Sawyer, 2010). The team that wants to obtain the knowledge is primarily curious about the knowledge, analysis and development process that the external team is carrying out (Zahra & George, 2002). When such cooperation between external teams takes place, they have a joint project. The teams then also want to share the knowledge and implement it into the project so that it is a positive outcome for both. Because more knowledge and experience are present during such a project, this knowledge can be used to make better decisions during the operation (Backmann et al., 2015).

Team members who find similar characteristics in the external team, on an individual level, such as similar values and culture, make it is easier to form a connection with the external team and communication between the internal and external team will be better. This makes it more likely that more knowledge will be passed on to each other because there is regular contact between the team members (Backmann et al., 2015).

2.4 Teamwork

Once the decision has been made on what kind of team to assemble, there needs to be an emotional and physical change between the members to form a real team. This change goes along with team conflicts that the team needs to work on (Blatchford, 2007).

A team conflict is a conflict within the team. It can arise for reasons such as different goals, values and perceptions of the team members (Lau & Murnighan, 1998). A conflict usually occurs when a decision has to be made or when the team is in a complex project (De Dreu & West, 2001). A conflict is often a disagreement that has to do with interest or kind of ideas. An example of this can be that there is a difference between personal taste, certain values or styles. This type of conflict distracts the team from achieving the desired result and makes the team members less satisfied (De Dreu & Weingart, 2003; Woerkom & Engen, 2009). What is shown is that team members who have a conflict come with more original problem-solving techniques, considering a conflict brings creativity and helps to avoid group-thinking (De Dreu & Weingart, 2003; Guffey, 2018; Woerkom & Engen, 2009). It is practically impossible for a team not to have a collision during a project. It is, however, true that if the team is well attuned to each other and there is good cooperation, the chance of conflicts is considerably smaller. Even though conflicts are almost impossible to avoid, it is better to bypass them. With a good team composition, you can get very far for a suitable collaboration (Huckman & Staats, 2011).

Team learning is according to Ellis et al., (2003) "a process that yields a relatively permanent change in the team's collective level of knowledge and skill produced by the shared experience of the team members" (p. 822). Team learning is important for team members so that they learn to work together effectively (Decuyper et al., 2010; Zaccaro, S. J., Ely, K., & Shuffler, M., 2008). The goal of team learning is that people can learn not only from their direct experience but also from the experiences of people they work with, which is seen as indirect experience (Ickes & Gonzalez, 1994; Woerkom & Engen, 2009). This indirect experience can then be passed on in the form of feedback, explanations or advice from the other person (Ellis et al., 2003; Woerkom & Engen, 2009). Team learning is seen as an important element in the individual development of team members, team effectiveness and innovation within the team. (Decuyper et al., 2010; Sweet & Michaelsen, 2007; Van den Bossche et al., 2006;). Going back to the conflict, when there is team learning from it, this is positive for the team and its performance. However, when these conflicts formally take place, this has a negative effect on team performance, because the team will focus more on the conflict instead of the project. (Woerkom & Engen, 2009).

Task conflicts, which are conflicts regarding the project, are still functional, but relationship conflicts, which are conflicts compared with personal emotions like irritation and anger are not functional (Jehn, 1995; Woerkom & Engen, 2009). The latter causes the team performance to drop and team members to be less satisfied within the team (De Dreu & Weingart, 2003; Woerkom & Engen, 2009).

Psychological safety

In the first place, it is crucial that there is trust among the team members, which is very important when working with a team that depends on each other (Molleman & Slomp, 2006; Wilke & Meertens, 1994). As an example, when something occurs within the team, for instance, miscommunication, a problem or the sharing of ideas, it is important that team members can express themselves without negative judgments being attached to it. Team members should be able to communicate openly and honestly with each other during their cooperation, which will ensure a more fluent process (Molleman & Slomp, 2006). If this is not the case, and team members feel that they cannot express themselves in the team, then the team members will not feel mentally safe and the collaboration will be less smooth (Salas, McDaniel, & Reyes, 2018). In order to prevent this, psychological safety is needed. Psychological safety is that people dare to take social risks without being negatively judged (Rosenbaum, 2019).

It is certainly important to ensure that the team members feel safe within the team (Somech & Drach-Zahavy, 2013). According to De et al., (2020) psychological safety is "a shared belief that the team is safe for interpersonal risk-taking and a causal model mediated by learning behaviour and efficacy" (p.1). In psychological safety, the member feels engaged, safe to learn and participate and safe to face challenges without fear that this person may be humiliated or punished in some way (Clark, T. R., 2019). When each topic can be put on the table, team members are more open with each other and the cooperation will be better, which makes that the team members are willing to work harder on a project. In this way, less time will be wasted, and results can be achieved faster (Miller, 2018; Somech & Drach-Zahavy, 2013).

Leadership

In order to keep track of a team's improvements and performance, the organization must monitor and evaluate its teams in terms of the goals achieved. Leadership and clarity are about what is expected of the team members. As things go without clarity and no clear leadership, the team may work aimlessly without having a proper overview of the target they are working towards (Blatchford, 2007; Salas, McDaniel, & Reyes, 2018). The team leader's task is to coordinate and steer the team towards the goal they are working on, mainly by making a plan and distributing roles among the team members (Bechky & Okhuysen, 2011; Sieweke & Zhao, 2015). When the team leader has a certain vision and opinions, the team members are likely to adopt these (Salas, McDaniel, & Reyes, 2018).

For a team to work efficiently, a leader must be appointed (Zaccaro, Rittman, & Marks, 2001). Leadership is the act of motivating a group of people to act toward achieving a common goal (Wagner & Ostick, 2013), doing the right things, at the right time, every day for the team that the leader oversees (Ferrell, 2016), address both social and task-related problems in a team to find and implement appropriate solutions (Zaccaro, Rittman, & Marks, 2001) and to find out which leadership style suits best for the team (Gallos & Heifetz, 2008; Hawkins et al., 2011). These persons are often seen as an expert. The experience, reputation, knowledge and skills of this person are then considered (Ericsson, 2008; Salas, McDaniel, & Reyes, 2018). Most leaders have strong skills such as connecting with people, communicating effectively, adapting to unexpected situations, and being open-minded (Ferrell, 2016; Groover & Gotian, 2020).

Wagner & Ostick (2013) say that the leader should use a positive attitude to accomplish change by the group that he or she is leading. This is because an individual has his or her own strengths and weaknesses. It is important for the leader to notice these and make use of them. If a team fails in certain things, it is not always because an individual has failed in his or her task. Often the cause is the failure of coordination within the team (Zaccaro, Rittman, & Marks, 2001).

The efficient coordination of a team is therefore not self-evident. A team, especially one that belongs to top management, often has different agendas, a lot of information that needs to be processed and has daily changes at a fast pace. Many teams often have a supervisor who is responsible for the goals they have to achieve. This person selects the team members and provides the materials and knowledge the team needs to move forward. If the team has all the information it needs to move forward, the leader should mainly let them go. (Zaccaro, Rittman, & Marks, 2001). It is essential that there is mutual respect between the team leader and the team members. The members must know that they are valued, and the leader must feel that the members want to learn his knowledge (Groover & Gotian, 2020).

Further, a leader cannot use the same style for years. It depends on the situation in which the team finds itself at that particular moment (Gallos & Heifetz, 2008; Hawkins et al., 2011). Nowadays, a leader must frequently use technological means of communication, which is called "e-leadership" or "virtual leadership" (Hambley et al., 2006). Of course, communication does not only take place virtually but also in real life. To get a message across to the team members and making sure that everyone is on the same page, communication is required (de Vries et al., 2010; Groover & Gotian, 2020). According to de Vries et al. (2010), knowledge sharing is an interesting way to communicate with team members. Because sharing the knowledge provides something positive to the team members, they experience the supervisor as a help person instead of an obstacle to the project. An experimental study by Awamleh & Gardner (1999) focused on the effects of content and information delivery by a leader who acted charismatically and effectively. The study showed that when a leader had an enthusiastic, expressive style of delivering the information, this had a stronger effect than when the information was delivered in the form of a speech. This is because enthusiasm feels more human than just the speech about the information that is needed. Team members feel valued and are more likely to accept the leader's instructions (de Vries et al., 2010).

Team familiarity

Team familiarity is the average number of times that each member has worked with other members of the team and identify themselves to be familiar with each other based on the work experience they share (Huckman, Staats & Upton, 2009; Staats, 2011). Team members who work together on a regular basis build up a social base and are thus able to coordinate task-related actions (Goodman & Leyden, 1991; Staats, 2011). So, this means that when a group of individuals has worked together, this group may perform better than a group who share the same amount of knowledge and experience but never have worked together (Harisson et al., 2003; Huckman & Staats, 2011). In order to solve certain issues in a team, it is useful to know what knowledge someone has. When one has already worked together, it is easier for the individual to locate the experiences and knowledge of the other team member (Gino, et al., 2010; Lewis, 2003). This is called a transactive memory system (Lewis, 2003; Staats, 2011). Good cooperation within the team creates an opportunity for psychological safety, a shared team belief where the team members feel socially accepted. Individuals may increase the quality and quantity of the knowledge they share together, resulting in a better overall outcome to the goal. (Huckman & Staats, 2011; Reagans et al., 2005).

A disadvantageous effect described by Xie et al. (2020) is that a familiar team may get stuck in the way of communication. When person A has a question, it goes to person B. But in complicated assignments or when inventing innovations, these communication techniques sometimes must be changed so that person A immediately goes to person D for a solution (Huckman & Staats, 2011; Xie et al., 2020). Idea generation could also be a possible obstacle since teams that are not very familiar with each other generate many ideas but fail to implement them. While teams that are familiar with each other will generate fewer ideas and thus may have less creativity as an obstacle (Anderson, Potočnik & Zhou, 2014; Xie et al., 2020).

3. Research design

In this study, quantitative research was conducted to provide an answer on how to build a team that will lead to success, with knowledge, experience, diversity, and psychological safety being the parameters of the team. For this purpose, data is collected from publications to further investigate the aspects of a team.

3.1 Data collection

The publication data was collected via Web of Science. The aim is to observe the team activity of 10 scientists in the specific field of management sciences. For this study, five authors were randomly selected out of the list of WoS highly cited authors of the year 2014. To also efficiently observe the team activity of less eminent scientists, I extended the set of five highly cited scientists with five additional scientists which were randomly picked out of the co-authors list of the highly cited scientists. The team activity of these 10 authors was then gathered by extracting all their publications between 2005 and 2015 within a management field -economics, business management, business finance and operation research management science – from the web of science. When the data of an author could be downloaded to be examined, all publications of this author were known, it included who the co-authors were, the date when it was released, how many pages the publication had, the keywords that were used and how many times the publication had been cited until now. In total, I obtained a sample of 221 team observations (publications with more than one author) from 253 authors.

To capture, the characteristics of each team member on these publications, the publications of all co-authors were additionally extracted from Web of Science, between 2000 and 2015 within a management field -economics, business management, business finance and operation research management science.

The data collection was done manually, which means that each author's name had to be entered into a code on Web of Science and then the data had to be downloaded manually. In total, the publications of 253 authors were collected to conduct this study.

3.2 Data analysis

Before the acquired data could be examined, Ms. Linde Colen made sure that all data could be processed in Stata, a statistical software program. This data was then analysed by means of a regression analysis.

Based on the literature consulted, the data research is further based on this with the main and sub-questions in mind. The data research first looks at the characteristics of the main author and keeps them as control variables. After that, variables related to the team with which he operates are included in the regression to examine the research questions. In this way, conclusions can be drawn as to what determines a high-performing team.

4. The variables and descriptive statistics

A summary of all variables and their meaning can be found in Table 1. Table 2 is the descriptive table where all the key statistics can be found, and a matrix of correlations among these variables is reported in Table 3.

4.1 Dependent variable

As can be seen in Table 1 the dependent variable is the number of citations, which means the number of citations obtained for a publication in the first three years. This variable is a quality indicator of the team publication, so this will be used in all the regressions.

Because the dependent variable is a count variable, a negative binomial regression with robust estimations will be used in the analysis.

4.2 Control variables

The control variables are set up based on the characteristics of the main authors, the ten authors of which all team publications form the study's sample. The control variables are most often based on the publication output of that main author during the four years before the team publication that is being examined.

The first control variable is publication year, the year in which the team publication was released.

The second control variable is the average number of publications of the main author, four years for a team publication. The average number of publications is a skill indicator of the main author.

A further characteristic of the main author that is considered is the average number of citations of the main author, four years before the publication. This variable can also be used as a skill indicator, as the average number of citations obtained for the publication will be considered.

Next, the time that the main author has been professionally active in publishing. This variable takes the publication year of the first published article of the scientist as a starting point of his academic career.

Then it looks at the number of publications during the past four years in which the main author has used the same keywords as those of the team publications. The ten main authors seem not to focus on one subject, in total there are 3,688 different keywords used in the publications, which increases the main authors' expertise and thus their knowledge on certain issues. This is measured by the keywords that the main authors use in the publications.

The number of keywords is also used as a control variable. This is the number of keywords used by the main author in the publication. This is an indicator of the breadth of knowledge of the publications and how diverse the knowledge is behind the publications.

The last control variable is the number of authors. With this variable, only publications with more than one author are considered. In this way, it is possible to look at publications in a team context.

These variables are then used as control variables to guide the variables related to the team context.

Table 1 Description of Variables

| Variable | Type | Description |
|--------------------------------------|----------------------|--|
| Number of citations | Dependent variable | The number of citations obtained for a publication in the first three years. |
| Publication year | Control variable | The year in which the publication was released. |
| Publications main author | Control variable | The average number of publications of the main authors. Looking at the four years before the publication year to calculate the average number of publications. |
| Citations main author | Control variable | The average number of citations of the main authors. Looking at the four years before the publication year to calculate the average number of citations. |
| Professionally active main author | Control variable | The time that the main authors are professionally active. Measured from the first published article of the author as a starting point of his academic career. |
| Knowledge main author | Control variable | The number of publications during the past four years in which the main authors have used the same keywords as those of the team publications. |
| Number of keywords main author | Control variable | The number of keywords that are used by the main authors in the publication. |
| Team experience main author | Control variable | The experience of main authors working in a team by indicating the average team size they have been working in during the past four years before the publication year. |
| Team experience non-main author | Variable of interest | The experience of co-authors working in a team by indicating the average team size they have been working in during the past four years before the publication year. |
| Average publications non-main author | Variable of interest | The number of publications non-main authors on average has published, four years before the publication year. |
| Average citations non-main author | Variable of interest | The average number of citations of non-main authors. Looking at the four years before the publication year to calculate the average number of citations. |

| | | |
|---|----------------------|--|
| Average professionally active non-main author | Variable of interest | The number of years non-main authors on average have been professionally active. |
| Familiarity main author | Variable of interest | How often main authors on average have worked together with team members on publications. This variable indicates the average number of co-publications that the team members in a team have done together four years before the publication year. |
| Familiarity non-main author | Variable of interest | How often non-main authors on average have worked together with team members on publications. This variable indicates the average number of co-publications that the team members in a team have done together four years before the publication year. |
| Familiarity team | Variable of interest | The average co-publications between team members, four years before the publication year. |
| Team experience team | Variable of interest | The average team size of the past publications that the authors have worked in, four years before the publication year. |
| Familiarity and team experience | Variable of interest | Interaction between the familiarity of a team, the average co-publications between team members, four years before the publication year and team experience, the average team size of the past publications that the authors have worked in, four years before the publication year. |
| Professionally active team | Variable of interest | The time that the authors are professionally active. Measured from the first published article of the authors as a starting point of his academic career. |
| Familiarity and professionally active team | Variable of interest | Interaction between the average co-publications between team members, four years before the publication year and the number of years the authors on average have been professionally active. |
| Knowledge non-main author | Variable of interest | The number of publications during the past four years in which the non-main authors have used the same keywords as those of the team publications. |
| Knowledge main author and knowledge non-main author | Variable of interest | Interaction between the number of publications during the past four years in which the main authors have used the same keywords as those of the team publications and the number of publications during the past four years in which the non-main authors have used the same keywords as those of the team publications. |

| | | |
|--|----------------------|--|
| Knowledge team | Variable of interest | The number of publications during the past four years in which the authors have used the same keywords as those of the team publications. |
| Team knowledge and professionally active | Variable of interest | Interaction between the number of publications during the past four years in which the authors have used the same keywords as those of the team publications and the time that the authors are professionally active. Measured from the first published article of the authors as a starting point of his academic career. |
| Team knowledge and team experience | Variable of interest | Interaction between the number of publications during the past four years in which the authors have used the same keywords as those of the team publications and the average team size of the past publications that the authors have worked in, four years before the publication year. |
| Diversity team publication | Variable of interest | The minimum number of publications of a team subtracted from the maximum number of publications of a team. This shows the publication diversity in a team. |
| Diversity team experience | Variable of interest | The minimum number of team members with whom an author has made previous publications deducted from the maximum number of team members with whom an author has made previous publications. This variable shows the diversity of how experienced the team members are working with teams. |
| Diversity professional active team | Variable of interest | The least a team member has been professionally active subtracted from the longest a team member has been professionally active. This shows the diversity of professional activity in a team. |
| Diversity team knowledge | Variable of interest | The minimum knowledge by keywords subtracted from the maximum knowledge by keywords of team members. This shows the diversity of knowledge in a team. |
| Absorptive knowledge capacity | Variable of interest | Indication if a team member has a certain level of knowledge of a subject. |

Table 2 Descriptive Statistics

| Variable | Mean | Std.dev. | Minimum | Maximum |
|---|----------|----------|---------|---------|
| Number of citations | 16.51131 | 18.07676 | 0 | 118 |
| Publication year | 2010.683 | 3.002899 | 2005 | 2015 |
| Publications main author | 9.660633 | 6.235364 | 0 | 24 |
| Citations main author | 15.85192 | 12.29961 | 0 | 64 |
| Professionally active main author | 15.26697 | 12.19263 | 1 | 40 |
| knowledge main author | .3326115 | .4138932 | 0 | 2 |
| Number of keywords main author | 6.714932 | 4.001727 | 0 | 10 |
| Team experience main author | 3.031674 | .9926509 | 2 | 7 |
| Team experience non-main author | 1.984685 | 1.356371 | 0 | 4.33 |
| Average publications non-main author | 3.447662 | 3.631878 | 0 | 19.5 |
| Average citations non-main author | 10.42676 | 10.39384 | 0 | 50 |
| Average professionally active non-main author | 6.259772 | 6.91805 | 0 | 43 |
| Familiarity main author | 5.147576 | 4.486956 | 0 | 24 |
| Familiarity non-main author | 1.364991 | 1.48529 | 0 | 8 |
| Familiarity team | 4.0633 | 4.489437 | 0 | 24 |
| Team experience team | 2.693395 | .7232803 | 0 | 4.08 |
| Professionally active team | 11.1682 | 8.71226 | 1 | 40 |
| Knowledge non-main author | .1640033 | .2335329 | 0 | 1 |
| Knowledge team | .2410288 | .2799696 | 0 | 2 |
| Professionally active team | 11.1682 | 8.71226 | 1 | 40 |

Notes: Observations: 221

Table 3 Corrolation matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|--|--------|--------|--------------|--------|--------------|--------------|--------|--------|--------|--------------|--------|--------|--------------|--------|--------|-------|--------|-------|-------|
| 1.Number of citations | 1.000 | | | | | | | | | | | | | | | | | | |
| 2.Publication year | -0.070 | 1.000 | | | | | | | | | | | | | | | | | |
| 3.Publications main author | -0.088 | 0.272 | 1.000 | | | | | | | | | | | | | | | | |
| 4.Citations main author | 0.373 | 0.079 | -0.169 | 1.000 | | | | | | | | | | | | | | | |
| 5.Professionally active main author | 0.186 | -0.030 | 0.472 | 0.350 | 1.000 | | | | | | | | | | | | | | |
| 6.Knowledge main author | 0.113 | -0.079 | 0.112 | 0.202 | 0.182 | 1.000 | | | | | | | | | | | | | |
| 7.Number of keywords main author | 0.203 | -0.024 | -0.025 | 0.122 | 0.017 | 0.468 | 1.000 | | | | | | | | | | | | |
| 8.Team experience main author | -0.121 | 0.244 | 0.310 | -0.067 | 0.243 | -0.044 | 0.045 | 1.000 | | | | | | | | | | | |
| 9.Team experience non-main author | 0.035 | 0.204 | 0.145 | 0.100 | 0.096 | 0.296 | 0.442 | 0.183 | 1.000 | | | | | | | | | | |
| 10.Average publications non-main author | 0.045 | 0.251 | 0.355 | -0.026 | 0.189 | 0.224 | 0.312 | 0.266 | 0.610 | 1.000 | | | | | | | | | |
| 11.Average citations non-main author | 0.307 | 0.033 | 0.054 | 0.207 | 0.198 | 0.381 | 0.389 | 0.008 | 0.570 | 0.476 | 1.000 | | | | | | | | |
| 12.Professionally active non-main author | 0.238 | -0.102 | 0.054 | 0.111 | 0.063 | 0.244 | 0.343 | -0.011 | 0.459 | 0.412 | 0.346 | 1.000 | | | | | | | |
| 13.Familiarity main author | -0.071 | 0.185 | <u>0.717</u> | -0.115 | 0.381 | -0.091 | -0.362 | 0.007 | -0.354 | -0.103 | -0.253 | -0.208 | 1.000 | | | | | | |
| 14.Familiarity non-main author | 0.062 | 0.282 | 0.286 | -0.033 | 0.069 | 0.155 | 0.239 | 0.052 | 0.538 | <u>0.872</u> | 0.417 | 0.439 | -0.054 | 1.000 | | | | | |
| 15.Familiarity team | -0.057 | 0.141 | 0.520 | -0.093 | 0.294 | -0.170 | -0.411 | -0.039 | -0.464 | -0.155 | -0.320 | -0.252 | <u>0.950</u> | -0.085 | 1.000 | | | | |
| 16.Team experience team | -0.090 | 0.188 | 0.537 | 0.039 | 0.468 | 0.058 | -0.057 | 0.331 | 0.294 | 0.190 | 0.037 | 0.009 | 0.430 | 0.082 | 0.351 | 1.000 | | | |
| 17.Professionally active team | 0.192 | -0.078 | 0.347 | 0.290 | <u>0.731</u> | 0.017 | -0.207 | 0.040 | -0.464 | -0.155 | -0.320 | -0.252 | 0.560 | -0.005 | 0.580 | 0.398 | 1.000 | | |
| 18.Knowledge non-main author | 0.142 | 0.153 | 0.135 | 0.045 | 0.121 | 0.447 | 0.363 | 0.060 | 0.392 | 0.602 | 0.495 | 0.282 | -0.128 | 0.604 | -0.145 | 0.028 | -0.145 | 1.000 | |
| 19.Knowledge team | 0.132 | 0.086 | 0.097 | 0.166 | 0.113 | <u>0.868</u> | 0.458 | -0.070 | 0.261 | 0.345 | 0.390 | 0.242 | -0.59 | 0.340 | -0.087 | 0.024 | -0.087 | 0.012 | 1.000 |

Notes: Observations: 221

Table 3 shows that there are 5 strong correlations. There is a high positive correlation between familiarity main author and publications main author. Then there is a strong positive correlation between familiarity non-main author and average publications non-main author. After that there is a very strong positive correlation between familiarity team and familiarity main author. Thereafter, there is a positive correlation between professionally active team and professionally active main author and finally there is a strong positive correlation between knowledge team and knowledge main author.

4.3 Results

Control variables

Table 4 Control variables main author

| Number of citations | Coef. | Z | P> z |
|-----------------------------------|------------|-------|-------|
| Publication Year | -.0377117 | -1.54 | 0.125 |
| Publications main author | .0010858 | 0.08 | 0.938 |
| Citation main author | .0271147 | 4.44 | 0.000 |
| Professionally active main author | .0129278 | 1.87 | 0.061 |
| Knowledge main author | -.1643745 | -1.02 | 0.309 |
| Number of keywords main author | .0647975 | 3.01 | 0.003 |
| Team experience main author | -.1060528 | -1.40 | 0.162 |
| Constant | 77.81911 | 1.58 | 0.114 |
| Observations | 221 | | |
| F-value | 51.41 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -822.41082 | | |

Notes: Robust estimation, negative binomial regression.

First is the publication year and this is not significant. Next is the number of publications of the main authors, four years before the team publication was issued. This variable is added to examine whether it is better if a main author has published more or less, four years before the team publication. This variable is insignificant.

Then it shows the average number of citations of the main author, four years before the team publication was released. This is significant and has a positive coefficient, meaning that a scientist with a high quality of publications will receive more citations on a new team publication than a scientist who has received fewer citations on past publications.

Next comes the variable of how long the main author professionally is active. This is significant ($p < 0.10$) and has a positive coefficient, which means that the longer the main author is professionally active, i.e., the longer he has been in the profession, the more citations he will obtain on the next publication.

The following shows the keywords of the main author in which the knowledge areas of the publication are examined according to the number of previous publications with the same keywords. This variable is not significant.

Then the number of keywords of the main author is added. This is significant with a positive coefficient. This concerns the number of keywords that are used by the main author in the publication. This is an indicator of the breadth of knowledge of the publication and how diverse the knowledge is behind the publication. Here it means that the more keywords that are used in a publication, the more citations the main author will obtain on the next publication.

Finally, there is the variable team experience main author. This is added to find out the effect of team size, the effect of working in a team. It is not significant.

Variables of interest

The variables of interest are the variables that will be investigated in relation to the literature study and the main and sub-questions.

Team experience

Table 5 Team experience

| Number of citations | Coef. | Z | P> z |
|-----------------------------------|------------|-------|-------|
| Publication Year | -.0276089 | -1.15 | 0.252 |
| Publications main author | .0014943 | 0.11 | 0.914 |
| Citation main author | .028971 | 4.45 | 0.000 |
| Professionally active main author | .0131409 | 1.93 | 0.054 |
| Knowledge main author | -.113243 | -0.66 | 0.510 |
| Number of keywords main author | .0804039 | 3.42 | 0.001 |
| Team experience main author | -.0942412 | -1.25 | 0.210 |
| Team experience non-main author | -.1088124 | -1.79 | 0.074 |
| Constant | 57.5213 | 1.19 | 0.234 |
| Observations | 221 | | |
| F-value | 48.34 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -820.96627 | | |

Notes: Robust estimation, negative binomial regression.

In Table 5, the team experience is considered. Working in teams measures to what extent the main authors and the non-main authors in previous publications have worked in a team. The variable team experience non-main author measures the experience of authors by indicating the average team size they have been working in during the past four years. This variable is significant ($p < 0.10$) and has a negative coefficient, this means that the fewer experience authors of the team publication on average have in working in a team, the more citations they will get for the next publication.

Characteristics of a team

Table 6 Characteristics of a team

| Number of citations | Coef. | Z | P> z |
|---|------------|-------|-------|
| Publication Year | -.0400863 | -1.70 | 0.089 |
| Publications main author | .0082943 | 0.60 | 0.546 |
| Citation main author | .0237286 | 4.24 | 0.000 |
| Professionally active main author | .0104745 | 1.60 | 0.109 |
| Knowledge main author | -.2174209 | -1.42 | 0.155 |
| Number of keywords main author | .0449225 | 2.03 | 0.043 |
| Team experience main author | -.0854123 | -1.13 | 0.257 |
| Average publications non-main author | -.0273707 | -1.25 | 0.213 |
| Average citations non-main author | .0203921 | 2.71 | 0.007 |
| Average professionally active non-main author | .009353 | 1.14 | 0.254 |
| Constant | 82.51035 | 1.75 | 0.081 |
| Observations | 221 | | |
| F-value | 77.50 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -818.38519 | | |

Notes: Robust estimation, negative binomial regression.

Here are the characteristics of a team prepared. The attached variables look at the non-main author. With these variables, it is still possible to examine team relations, but they exclude the main author. Thus, only the co-authors of the main authors are examined.

The number of publications non-main authors on average have published, four years before the publication year is added. This is not significant.

Thereafter, the average number of citations non-main authors are added. This is significant and has a positive coefficient, which means that if non-main authors on average obtain a high number of

citations on their publications, that team of non-main authors will most likely also obtain a higher number of citations on their team publication.

Another characteristic in a team is the number of years a team member in this case, the non-main author, has on average been professionally active. This is not significant.

Familiarity

Table 7 Team Familiarity

| Number of citations | Coef. | Z | P> z |
|-----------------------------------|------------|-------|-------|
| Publication Year | -.0452793 | -1.81 | 0.070 |
| Publications main author | -.0330981 | -1.31 | 0.191 |
| Citation main author | .0280216 | 4.46 | 0.000 |
| Professionally active main author | .01051 | 1.59 | 0.111 |
| Knowledge main author | -.1225686 | -0.76 | 0.448 |
| Number of keywords main author | .0759346 | 2.94 | 0.003 |
| Team experience main author | -.0297401 | -0.32 | 0.751 |
| Familiarity main author | .0524372 | 1.71 | 0.087 |
| Familiarity non-main author | .0698721 | 1.24 | 0.217 |
| Constant | 92.69572 | 1.85 | 0.064 |
| Observations | 221 | | |
| F-value | 52.25 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -820.81698 | | |

Notes: Robust estimation, negative binomial regression.

Table 7 examines team familiarity. Familiarity is a variable that shows how often team members have already worked together. This can be an indicator of psychological safety. The average familiarity of main authors, thus how often main authors on average have worked together with team members, and non-main authors, thus how often non-main authors have worked together with team members, is added in the table and these variables indicate the average number of co-publications that the team members in a team have done together. So, the average number of times

the team members have worked together. The familiarity of the main author is significant with a positive coefficient. This illustrates that when main authors have done on average more co-publications together with team members, that team will obtain more citation on the next publication.

The variable familiarity non-main author is also an indicator of how often that person on average has done co-publications, but as can be seen, this variable is insignificant.

Table 8 Team familiarity and team experience

| Number of citations | Coef. | Z | P> z |
|--------------------------------------|------------|-------|-------|
| Publication Year | -.0379896 | -1.55 | 0.122 |
| Publications main author | -.0187071 | -0.94 | 0.346 |
| Citation main author | .0264989 | 4.23 | 0.000 |
| Professionally active main author | .0195335 | 2.77 | 0.006 |
| Knowledge main author | -.1218575 | -0.72 | 0.472 |
| Number of keywords main author | .0820986 | 3.31 | 0.001 |
| Team experience main author | .003046 | 0.03 | 0.972 |
| Familiarity team | .2325112 | 1.94 | 0.053 |
| Team experience team | -.0689458 | -0.59 | 0.559 |
| Familiarity and team experience team | -.0596382 | -1.68 | 0.093 |
| Constant | 77.96007 | 1.59 | 0.113 |
| Observations | 221 | | |
| F-value | 61.15 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -818.04388 | | |

Notes: Robust estimation, negative binomial regression.

In Table 7, there is an interaction between familiarity of a team, the average co-publications between team members, four years before the publication year and team experience, the average team size

of the past publications that the authors have worked in, four years before the publication year included in the regression analysis.

The familiarity on team basis is added and it is visible that it is significant with a positive coefficient. This means that when authors on an average basis worked together on a publication, so a co-publication, this results in more citations for the next team publication.

Team experience is added next. This is the experience that authors have in working in a team. It is insignificant.

The interaction between team familiarity and team experience of the authors is significant with a negative coefficient. This means that it is better to have a team that has a high degree of familiarity, or, to have a team that has a lot of experience working in groups. When both characteristics are present in a team, it has a detrimental effect.

Table 9 Familiarity and professionally active

| Number of citations | | Coef. | Z | P> z |
|--|------------|-----------|-------|-------|
| Publication Year | | -.0453195 | -1.62 | 0.106 |
| Publications main author | | -.0175189 | -0.93 | 0.355 |
| Citation main author | | .0149373 | 4.10 | 0.000 |
| Professionally active main author | | .0012763 | 0.16 | 0.875 |
| Knowledge main author | | -.1465339 | -0.84 | 0.402 |
| Number of keywords main author | | .0758595 | 2.75 | 0.006 |
| Team experience main author | | -.0116055 | -0.13 | 0.896 |
| Familiarity team | | .0616622 | 1.73 | 0.083 |
| Professionally active team | | .0381589 | 2.26 | 0.024 |
| Familiarity and professionally active team | | -.0024316 | -1.66 | 0.097 |
| Constant | | 93.0582 | 1.66 | 0.098 |
| Observations | 221 | | | |
| F-value | 61.59 | | | |
| Prob > F | 0.000 | | | |
| Log Likelihood | -911.07453 | | | |

Notes: Robust estimation, negative binomial regression.

In Table 9, there is an interaction between the average co-publications between team members, four years before the publication year and the number of years the authors on average have been professionally active.

The team familiarity is significant with a positive coefficient. This means that if the average amount of team members working together is higher, this will result in more citations for the next team publication.

Then the length of time that the members have been professionally active is added. This is also significant with a positive coefficient. This means that if on average, a team member is professionally active longer, this will result in more citations for the next team publication.

If both variables are used in an interaction, it is significant with a negative coefficient. This means that if one works with a less familiar team, one better chooses a team that has been professionally active for a longer time. If one works with a team that has not been professionally active for long, it is better to be a familiar team in order to obtain more citations on the next team publication.

Knowledge

Table 10 Team knowledge

| Number of citations | Coef. | Z | P> z |
|-----------------------------------|------------|-------|-------|
| Publication Year | -.0462487 | -1.91 | 0.056 |
| Publications main author | .0007766 | 0.06 | 0.955 |
| Citation main author | .0282834 | 4.69 | 0.000 |
| Professionally active main author | .0108486 | 1.61 | 0.108 |
| Knowledge main author | -.2731132 | -1.73 | 0.084 |
| Number of keywords main author | .0564119 | 2.62 | 0.009 |
| Team experience main author | -.1044503 | -1.39 | 0.163 |
| Knowledge non-main author | .560608 | 1.76 | 0.079 |
| Constant | 94.99035 | 1.96 | 0.050 |
| Observations | 221 | | |
| F-value | 55.12 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -821.05531 | | |

Notes: Robust estimation, negative binomial regression.

In Table 10, the team knowledge is examined. As knowledge, the number of publications of authors in which the same keywords are used as the team publication is examined. The more often a keyword recurs in such publications, the more knowledge the authors have in that area. In this regression analysis, the keywords of the main authors and the non-main authors are visible.

The knowledge of the main authors, which is examined based on the number of publications of main authors in which the same keywords are used as the team publication, is significant with a negative

coefficient. This means that if the main author has fewer publications with the same keywords, this will result in more citations for the next publication.

If one looks at the knowledge of the co-authors, the non-main authors, it is significant with a positive coefficient. From this, it can be concluded that if a co-author has more publications with the same keywords, this will give more citations for the next publication.

Table 11 Knowledge main author and non-main author

| Number of citations | Coef. | Z | P> z |
|---|------------|-------|-------|
| Publication Year | -.0444915 | -1.84 | 0.065 |
| Publications main author | -.0007236 | -0.05 | 0.959 |
| Citation main author | .028185 | 4.64 | 0.000 |
| Professionally active main author | .0110021 | 1.63 | 0.103 |
| Knowledge main author | -.3415033 | -1.91 | 0.056 |
| Number of keywords main author | .0593134 | 2.76 | 0.006 |
| Team experience main author | -.1054566 | -1.41 | 0.158 |
| Knowledge non-main author | .4079032 | 0.91 | 0.363 |
| Knowledge main author and non-main author | .2341306 | 0.50 | 0.618 |
| Constant | 91.4792 | 1.89 | 0.059 |
| Observations | 221 | | |
| F-value | 55.22 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -820.96142 | | |

Notes: Robust estimation, negative binomial regression.

In Table 10, is an interaction between the number of publications by main authors and non-main authors in which the same keywords are used as in the team publication. This is not significant. And it can also be seen that the significance of knowledge non-main author falls out as well.

Table 12 Team knowledge, professionally active and team experience

| Number of citations | | Coef. | Z | P> z |
|--|------------|-----------|-------|-------|
| Publication Year | | -.0343713 | -1.32 | 0.186 |
| Publications main author | | .0021541 | 0.14 | 0.888 |
| Citation main author | | .0294734 | 4.48 | 0.000 |
| Professionally active main author | | -.0008629 | -0.11 | 0.909 |
| Knowledge main author | | -.3960738 | -1.33 | 0.183 |
| Number of keywords main author | | .0688119 | 3.03 | 0.002 |
| Team experience main author | | -.0572493 | -0.75 | 0.455 |
| Knowledge team | | -1.086862 | -0.91 | 0.363 |
| Professionally active team | | .0300649 | 2.19 | 0.029 |
| Team experience team | | -.2690215 | -1.89 | 0.059 |
| Team knowledge and professionally active | | -.0048299 | -0.11 | 0.911 |
| Team knowledge and team experience | | .6063322 | 1.34 | 0.181 |
| Constant | | 71.41711 | 1.37 | 0.171 |
| Observations | 221 | | | |
| F-value | 62.40 | | | |
| Prob > F | 0.000 | | | |
| Log Likelihood | -818.05286 | | | |

Notes: Robust estimation, negative binomial regression.

In Table 11, an interaction is sought between recurring keywords used in team publications of team members and the average professional time of team members. There is also an interaction sought between recurring keywords used in team publications of team members and the average number of times that team members have had to work in a team. Both are not significant.

It can be seen that the professional time that team members are active on average is significant with a positive coefficient. This means that the longer team members are professionally active, the more citations this will generate for the next publication.

Next, it is found that the average number of times that team members have had to work in a team is also significant with a negative coefficient. This means that when team members have worked less in a team, therefore have less experience in working in a team, this will result in more citations for the next publication.

Diversity

Table 13 Team diversity

| Number of citations | Coef. | Z | P> z |
|------------------------------------|------------|-------|-------|
| Publication Year | -.04889 | -1.88 | 0.060 |
| Publications main author | .0115742 | 0.76 | 0.427 |
| Citation main author | .0282233 | 4.46 | 0.000 |
| Professionally active main author | .0138507 | 1.85 | 0.064 |
| Knowledge main author | -.4942538 | -2.06 | 0.039 |
| Number of keywords main author | .0633252 | 2.46 | 0.014 |
| Team experience main author | -.0994113 | -1.22 | 0.221 |
| Diversity team publication | -.0240345 | -1.48 | 0.139 |
| Diversity team experience | .0384958 | 0.38 | 0.707 |
| Diversity professional active team | -.007934 | -1.06 | 0.288 |
| Diversity team knowledge | .1594737 | 1.98 | 0.048 |
| Constant | 100.175 | 1.92 | 0.054 |
| Observations | 221 | | |
| F-value | 55.15 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -819.21466 | | |

Notes: Robust estimation, negative binomial regression.

To look at the diversity in a team, some additional variables were created here. The variables were looked on a team basis and the minimum values were subtracted from the maximum values. For example, diversity team publication, here the minimum number of publications of a team was subtracted from the maximum number of publications of a team. This can be used to see how different the team members are within a team.

Table 13 shows that four diversity variables have been added. Diversity team publication is the diversity in the team of publishing publications. This is not significant.

After that, the diversity of how experienced the team members are in working with teams is looked at, diversity team experience. This is the minimum number of team members with whom authors have made previous publications deducted from the maximum number of team members with whom authors have made previous publications. This variable is not significant.

Next, the diversity of age or time that a person has been professionally active was examined, diversity professional active team. This is the least a team member has been professionally active subtracted from the longest a team member has been professionally active. This is not significant.

Finally, I looked at the diversity of knowledge in a team. This is the minimum knowledge by keywords subtracted from the maximum knowledge by keywords of team members. This is significant and has a positive coefficient, which means that the more diversity expertise within the topic is present in a team, the more citations the team will obtain on the next team publication.

Absorptive capacity

To view the absorptive capacity of the team members in a team, a variable is created that indicates whether a team member has a certain level knowledge of a subject. To display that each team member had a minimum knowledge level, the minimum expertise level must be greater than zero. This variable is called absorptive knowledge capacity and that is the minimum expertise level on a team that looks at the keywords of publications and it is then set greater than zero.

Table 14 Absorptive team capacity

| Number of citations | Coef. | Z | P> z |
|-----------------------------------|------------|-------|-------|
| Publication Year | -.0289491 | -1.20 | 0.230 |
| Publications main author | -.0028515 | -0.20 | 0.841 |
| Citation main author | .0259988 | 4.31 | 0.000 |
| Professionally active main author | .0102962 | 1.40 | 0.162 |
| Knowledge main author | -.0667594 | -0.37 | 0.711 |
| Number of keywords main author | -.2404071 | -0.77 | 0.441 |
| Team experience main author | -.0886748 | -1.19 | 0.232 |
| Absorptive knowledge capacity | .5216033 | 2.34 | 0.019 |
| Constant | 60.49692 | 1.25 | 0.211 |
| Observations | 221 | | |
| F-value | 51.67 | | |
| Prob > F | 0.000 | | |
| Log Likelihood | -825.29186 | | |

Notes: Robust estimation, negative binomial regression.

As can be seen in Table 14, absorptive knowledge capacity is significant and has a positive coefficient. This means that it is better to have a team whose team members already have a minimum knowledge of a certain topic. This will ensure that the team will get more citations on the next team publication.

Regression analysis with all used variables

Table 15 Regression analysis with all variables

| Number of citations | Coef. | Z | P> z |
|---|-----------|-------|-------|
| Publication year | -.0211516 | -0.74 | 0.456 |
| Publications main author | -.0189899 | -0.47 | 0.640 |
| Citations main author | .0209934 | 3.19 | 0.001 |
| Professionally active main author | -.0073127 | -0.43 | 0.665 |
| knowledge main author | -.2903142 | -0.47 | 0.639 |
| Number of keywords main author | .0923816 | 3.58 | 0.000 |
| Team experience main author | .0254078 | 0.26 | 0.791 |
| Team experience non-main author | -.1903315 | -1.78 | 0.075 |
| Average publications non-main author | .0072986 | 0.14 | 0.890 |
| Average citations non-main author | .0336732 | 3.82 | 0.000 |
| Average professionally active non-main author | -.0106989 | -0.44 | 0.662 |
| Familiarity main author | .0433017 | 0.34 | 0.732 |
| Familiarity non-main author | -.0123824 | -0.11 | 0.916 |
| Familiarity team | .3019489 | 2.14 | 0.032 |
| Team experience team | -.054022 | -0.35 | 0.728 |
| Familiarity and team experience | -.1076349 | -2.71 | 0.007 |
| Professionally active team | .0897115 | 2.45 | 0.014 |
| Familiarity and professionally active team | -.0018221 | -0.99 | 0.322 |
| Knowledge non-main author | -.2151201 | -0.25 | 0.799 |
| Knowledge main author and knowledge non-main author | .7844786 | 1.12 | 0.261 |

| | | | |
|--|-----------|-------|-------|
| Knowledge team | -3.547767 | -2.03 | 0.042 |
| Team knowledge and professionally active | -.0485376 | -0.94 | 0.347 |
| Team knowledge and team experience | 1.318181 | 2.48 | 0.013 |
| Diversity team publication | -.0184644 | -0.90 | 0.369 |
| Diversity team experience | .1613488 | 1.16 | 0.244 |
| Diversity professional active team | -.012396 | -1.07 | 0.286 |
| Diversity team knowledge | .0591556 | 0.60 | 0.545 |
| Absorptive knowledge capacity | -.0157513 | -0.06 | 0.950 |
| Constant | 43.84596 | 0.77 | 0.441 |
| Observations | 221 | | |
| F-value | 90.26 | | |
| Prob > F | 0.0000 | | |
| Log Likelihood | -801.7603 | | |

Notes: Robust estimation, negative binomial regression.

Table 15 shows the regression table with all variables used during the study.

In the control variables, citations main author and the number of keywords main author are significant, and both have a positive coefficient. This means that it is better to work with a main author who on average has more citations on his publication, four years before the publication was published. The number of keywords main author means that the main authors should use more keywords in their publications in order to get more citations on the next publication.

The team experience non-main author is significant with a negative coefficient. This means that the co-authors on average should have less experience in working in teams in order to get more citations on the next publication.

The average citation non-main author is significant with a positive coefficient. This means just like the main author, it is better to work with co-authors who have on average more citations on their publication, four years before the publication was released, in order to get more citations on the next publication.

Familiarity team is significant with a positive coefficient, this means that it is better that authors on average have done more co-publications with the team members, so have worked together more. This will then result in more citations on the next team publication.

Familiarity team and team experience is significant with a negative coefficient. This means that it is better to form a team whose authors on average have done more co-publications with the team members, so have worked together more, and have less experience in working in a team. Or, a team has to be assembled that on average has worked less together and has more team experience, in order to get more citations on the next team publication.

Professionally active team is significant with a positive coefficient. This means that it is better to form a team whose members have been professionally active for a longer period.

Knowledge team is significant with a negative coefficient. This means that it is better to compose a team whose team members, on average, have fewer publications whose keywords recur in the team publications.

Team knowledge and team experience is significant with a positive coefficient. This means that it is better to compose a team of which the team members on average have more keywords that recur in the team publication and that the team members on average have more experience in working in a team in order to get more citations on the next team publication.

5. Discussion

Based on the data and findings described above, an answer is sought to the main question of how to build a successful team. Therefore, this study will focus on the sub-questions, whether a team member should have extensive knowledge of certain subjects when placed in a team, whether individual experience is important in a team, and what psychological safety does in a team.

This discussion chapter will follow the same order as the results chapter. First comes team experience, then the characteristics of a team, followed by team familiarity, then team knowledge, next the diversity of a team, and finally the absorptive capacity of a team. Here I will discuss the results in more detail using the theory obtained in the literature review and interpret what this possibly means for teams.

Table 5 shows the team experience and is also the first variable of interest. In this table, the experience of working in a team is examined. The table shows both the experience of the main authors and the non-main authors. The team experience of the non-main authors is significant and has a negative coefficient, which is also the case for the team experience of the main authors, only it is not significant. It is therefore visible that it is better to have non-main authors with on average less experience in working in a team. If only the coefficient of the main authors is looked at, it would say the same thing. It is a surprising result as team learning, for example, is important so that team members can learn to work together effectively (Decuyper et al., 2010; Zaccaro, S. J., Ely, K., & Shuffler, M., 2008). According to Singh & Fleming (2010), in a team, one learns to receive different types of feedback, which reduces tunnel vision. A negative effect of a team may be that if there are poor dynamics and mismanagement, team members will work less effectively. A possible explanation for the regression may then be why one works better with authors who on average have less team experience, as these authors are likely to have worked more effectively in the past because he or she has less team experience and may have published works that have received citations on their publications.

Table 6 shows the characteristics of a team. As can be seen and discussed there, the average number of citations four years before the publication of the co-author is significant with a positive coefficient. This means that it is better for co-authors to have obtained more citations on average four years before the publication, in order to obtain more citations on the next publication. The average number of publications four years prior to the publication of co-authors is not significant. However, one can look at the coefficient, which in this case is negative. This analysis might therefore say that it is better for co-authors to have published less on average, four years before the publication came out, in order to get more citations on the next publication. It is possible that for example, the co-authors may have spent more time and attention on a publication, so they published less, but obtained more citations because it contained a high value of information. Finally, the average professional active time of co-authors is considered. This is not significant and has a positive coefficient. Presumably one could say that on average it is better to work with co-authors who are professionally active for a longer time, in order to obtain more citations on the next publication. One possibility why this

would be better is that authors who have been professionally active for longer may have worked on more projects. This may mean that these authors have different perspectives on problem-solving and can thus arrive at a better solution (Bilalić et al., 2008; Verhoeven, 2020).

The table of familiarity (Table 7) shows the familiarity of the main author and the familiarity of the non-main authors. This variable indicates how often team members on average have worked together on co-publications and is an indicator of psychological safety. The familiarity of the main author is significant with a positive coefficient. This illustrates that when main authors have done on average more co-publications together with team members, that team will obtain more citations on the next publication. The familiarity of the non-main author is not significant but also has a positive coefficient. One can therefore possibly interpret that it is also better for the co-authors to have co-publish on average more often with other authors in order to obtain more citations for the next publication. According to Huckman & Staats (2011) and Harisson et al. (2003), teams that have collaborated with each other more often, thus having built up a higher familiarity with each other, which can be seen that there is a high presence of psychological safety, may achieve better results than teams that have not yet collaborated with each other.

In Table 8, there is an interaction between team familiarity and team experience. Hence, it is examined at team level how often on average authors have collaborated on a co-publication with other authors and how often on average authors have worked in a team. The interaction is significant and has a negative coefficient. This means that it is better to have a team that has a high degree of familiarity, or, to have a team that has a lot of experience working in groups, in order to obtain a higher number of citations on the following publication. When both characteristics are present in a team, it has a detrimental effect. A possible explanation for this outcome is that when, on average, people have worked together more often with the same authors and also have a high average level of experience in working in a team, it is possible to create a mental lock-in because a research project will not be viewed from a different perspective (Bilalić et al., 2008; Verhoeven, 2020). When team members are less familiar with each other but have a lot of experience, there is a possibility that each team member will use his individual expertise during that research (Xueming, Slotegraaf, & Xing, 2006). When there is more familiarity and less team experience, there is a chance that there is more trust among the team members and thus a higher psychological safety. In this way, there may be good cooperation within the team, leading to an effective collaborative team (Salas, McDaniel, & Reyes, 2018).

In Table 9, there is an interaction between team familiarity and the number of years an author is professionally active. This interaction is significant with a negative coefficient. This means that when one has a team that on average has worked together more often, one should take authors who have been professionally active for less time and if one works with a less familiar team, one better chooses a team that has been professionally active for a longer time. This may have to do with psychological safety. When there is a conflict in a team, it is advisable that the team members can talk about it openly and share their opinions (Molleman & Slomp, 2006). When working with team members who have been professionally active for less time and thus have less experience, it can be better to put

together a team that has worked together before in order to keep psychological safety high. Authors who have been active for longer know that it is practically impossible to have no inequalities during a project (Huckman & Staats, 2011), but the long experience allows the authors to solve this effectively because they probably know that open communication works in a team. Because of the work experience, the authors presumably do not need to have worked together in the past to function on a project.

In Table 10, the knowledge in a team is examined. As can be seen there, both the number of publications of authors in which the same keywords are used as the team publication is significant for the main authors and for the non-main authors. However, there is a difference. The main authors have a negative coefficient, and the non-main authors have a positive coefficient. This means that if the main authors have fewer keywords that recur in the team publications, this will result in more citations for the next publication. For co-authors, this is reversed, so the more the same keywords recur in team publications, the more citations for the next publication. A possible explanation for the regression analysis is that authors, in this case, the main authors, will obtain more citations if they are in a team with high expertise in a certain subject. The main authors are not an expert on the subject, but he or she does end up in a team of co-authors with a high level of expertise.

In Table 11, an interaction was done between the number of publications by main authors and non-main authors in which the same keywords are used as in the team publication. This is to see whether the relationship from Table 10 would be more clearly established if there was an interaction between the two variables. This is not significant, so no conclusion can be drawn.

In Table 12 an interaction was done between recurring keywords used in team publications of team members and the average professional time of team members. And there is also an interaction between recurring keywords used in team publications of team members and the average number of times that team members have had to work in a team. Both are not significant. The average professional time of team members is significant with a positive coefficient. From this, it can be concluded that it is better to form a team with authors who on average are active professionally longer in order to obtain more citations on the team publications. According to Littlepage et al. (1997), the experience that an individual has gained working on a number of projects, which most likely also means that that person has been active in the profession longer, gives more professional knowledge. Woerkom and Engen (2009) also cite that it is positive for a team if an individual has done several projects and gained more knowledge and experience over the years. Team experience is also significant in Table 12 with a negative coefficient. This means that it is better to have a team whose members have less experience of working in a team in order to get more citations on the next team publication. This is the same result as in Table 5. Littlepage et al. (1997) say that experience is seen as the knowledge an individual has about a certain subject. He extracts here two different types of experiences related to teams and that is the task experience and group experience. The variable being discussed now is about group experience and then, according to Littlepage et al., it is expected that if there is more group experience, the team members can better evaluate the experience and the knowledge of others. Again, the result is surprising, especially since it focuses

on the knowledge an author would have if they had more team experience. More experience, in general, is presumably beneficial for a team, which can possibly be examined as above with the time an author has been professionally active. The experience of working in a team can lead to surprising results, just as it was mentioned in Table 5 that the effectiveness can be less in a team when the team members are not attuned to each other.

Table 13 examines team diversity. This is done by subtracting the minimum value of a certain variable from the maximum value of a certain variable. Only the diversity of knowledge in a team is significant with a positive coefficient. This means that the more diverse expertise within the topic is present in a team, the more citations the team will obtain on the next team publication. Knowledge is something that someone as an individual possesses and that possession can strengthen the team (Boone & Hendriks, 2009). According to Huckman & Staats (2011), team members with different knowledge or background bring additional value to the team. These members view certain obstacles from a different perspective. Diversity of knowledge may bring more chances for innovative outcomes and more creativity (Huckman & Staats, 2011; Rock & Grant, 2016; Singh & Fleming, 2010).

In Table 14, absorptive capacity of a team is examined. According to the literature, absorptive capacity is the ability of an individual to learn (Cohen & Levinthal, 1990). If the individual already has a certain knowledge background, this can be increased by more education and training (Schmidt, 2010). According to Table 14, it is better for team members to have a certain level of knowledge of a topic in order to get more citations on the next team publication. The knowledge they already have and pass on to each other on a given topic may therefore give them an advantage over other teams (Seo et al., 2015).

Table 15 shows all variables used in a regression that were necessary for this study. Citations main author and average citations non-main author are both significant with a positive coefficient. This means that it is better for authors to have obtained more citations on average four years before the publication, in order to obtain more citations on the next publication. In Table 6, characteristics of a team, the regression gave the same result in terms of average citations.

In Table 15, team familiarity is significant with a positive coefficient, this is also the case in Table 8.

In Table 5, team experience is mentioned. Table 15 shows that team experience non-main author is significant with a negative coefficient. So, it is better to have non-main authors with less experience of working in a team on average, in order to get more citations in the next publication. Table 8 shows that familiarity and team experience are significant with a negative coefficient. In Table 15, there is the same result. This means that it is better to form a team whose authors on average have done more co-publications with the team members, so have worked together more, and have less experience of working in a team. In Table 15, the interaction between team knowledge and team experience is significant with a positive coefficient. This means that it is better to compose a team of which the team members on average have more keywords that recur in the team publication and that the team members on average have more experience with working in a team

in order to get more citations on the next team publication. In Table 12, this interaction was also done, it was not significant, but has the same coefficient. This table also shows that professionally active team is significant with a positive coefficient. This is also the case in table 15.

As can be read, many variables in the total regression correspond to the individual regressions examined in this study.

6. Conclusion and managerial implications

The result a team delivers depends on its team members. Therefore, this research will show what the characteristics of a successful team are and why it is useful to choose a particular team when striving for innovation. An answer to the question: how to compose a successful team on the basis of knowledge, experience, diversity and team composition, with the related questions: how important is it that a team member has a certain level of knowledge and experience in a team and does psychological safety affect a team.

The size of the team plays a crucial role in how the team will perform (Wheelan, 2009). The size of the team is determined by the goal that the team must achieve, the expectations of the team members, the roles that are assigned within the team and how the team must cohere and communicate with each other (Nieva, Fleishman, & Rieck, 1985). The research that has been carried out does not look so much at team size, but it looks at whether an author has experience in working in a team.

When working in a team it is noticeable that there are different kinds of knowledge of different domains (Rico et al., 2008). Knowledge diversity helps to lead to new ideas and useful connections, team members look at problems differently (Bilalić et al., 2008; Verhoeven, 2020). Experience is seen as the knowledge that an individual has about a particular subject, which this person has experienced himself (Littlepage et al., 1997). The research looks at the knowledge that authors have based on the keywords that he or she uses. It also looks at knowledge diversity and whether it has an effect if the author already has some basic knowledge.

When working with a team, it is important that there is trust between the team members (Molleman & Slomp, 2006; Wilke & Meertens, 1994). Therefore, psychological safety is needed in a team. Psychological safety is that people dare to take social risks without being judged negatively (Rosenbaum, 2019). In the study, psychological safety is examined on the basis of familiarity in the team. This means that it was investigated whether the team members had already worked together on a publication. According to Goodman & Leyden (1991) and Staats (2011) team members who work together on a regular basis build up a social base and are thus able to coordinate task-related actions. So, this means that when a group of individuals have worked together, this group may perform better than a group who share the same amount of knowledge and experience but never have worked together (Harisson et al., 2003; Huckman & Staats, 2011).

For this purpose, a quantitative study was carried out from the data of publications which were collected via Web of Science. All information that was needed to answer the above topics were findable in the data of the publications. In order to arrive at the answers, it was necessary to work with the analytical program Stata. Following which the data is analysed by means of a regression analysis.

According to the research that has been carried out and looking at the experience that authors have in working in teams, the result is that it is better to put authors in a team who, on average, have less experience in working in a team. If one then looks at the experience on the publications themselves, it is visible that it is better to work with authors who on average have obtained more citations on their previous publications. What can also be seen as experience is the time that authors are professionally active. The research shows that it is better to work with authors who are professionally active for longer in order to obtain more citations on the next team publication.

Knowledge of an author, which is investigated by the number of times a keyword recurs in a team publication, shows that it is better to work with authors who on average have more recurring keywords in team publications. The knowledge diversity in a team is also investigated, the result being that it is better to have more knowledge diversity in a team. And it is also better to have a team of which authors have a minimum knowledge of a certain subject in order to get more citations on the next team publication.

Team familiarity, which is the average number of times that each member has worked with other members of the team and identify themselves to be familiar with each other based on the work experience they share (Huckman, Staats & Upton, 2009; Staats, 2011). And that can be seen as psychological safety in a team. The first result here is that it is better to work with authors who have already worked together on a publication together. This means that the authors are familiar with each other. Second, when one works with authors who have a lot of team working experience, which means that these authors have experience in working in a team, it is better to put together a team that has worked less with each other in the past, so has less familiarity. If one has a team where authors have worked together more in the past, a high familiarity, then it is better to choose authors who have less experience in working in a team. The same applies to authors who have been professionally active for some time. If you have a team where authors have been professionally active for a long time, it is better to choose a team with less familiarity, meaning that they have worked less with each other in order to obtain more citations on the next team publication.

When the issues described here are taken into account by those who manage the composition of a team, more positive results may be achieved because there is now more understanding and clarity about what a team mainly consists of. When a person needs to put together a team, he or she can take the following points into account. It is better to put together authors who have less experience in working in teams, have obtained more citations on their previous publications and have been professionally active for a longer time. It is helpful if the authors have a basic knowledge of the subject in which the team will work and that the authors have high individual knowledge in topics in which they are strong and preferably that the knowledge among the authors differs so that there is diversity in knowledge. If a team is to be put together, psychological safety must be taken into account. If one chooses authors who have been professionally active for a shorter period of time, it is better if these persons have worked together on previous publications.

However, it must be taken into account that this study focuses on the knowledge, experience, diversity and psychological safety of team members. If the focus were to be placed elsewhere, then

the results might be different. for this reason, no general statement can be made about assembling a successful team.

7. Limitations and suggestions for further research

A major limitation has been time during this research. Because the data had to be collected manually, the sample of authors is relatively small and could not be increased within the time frame for this thesis. This may result in less significant results in the study.

For a follow-up study, it is recommended to collect more data from publications, therefore more author data, and to include them in the study. What also might be interesting for a future research is to look at more variables related to a team. This study looks at the experience that authors have working in a team. Here can be looked at what an ideal number of people is, to put together a team. The study also looks at the background knowledge of the authors. Other backgrounds of the authors, such as, origin, study and culture also have an impact on a team according to the literature. This could be investigated in the future in order to create a better picture of a successful team.

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