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Vloga socialnih omrežij pri timskem delu

The Role of Social Networks in Teamwork

Doktorska disertacija

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Zahvala

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Vloga socialnih omrežij pri timskem delu

Povzetek

V doktorski disertaciji obravnavamo koncept timskega dela in analiziramo dejavnike za njihovo uspešno delovanje. Timsko delo v organizacijski praksi ni nov pojav, saj je že več kot 50 let predmet analize v sociologiji organizacij in sociologije dela. Proučevanje timov in timskega dela je danes še posebej zanimivo, saj se "skoraj vse pomembne odločitve sprejmejo v timih, bodisi neposredno ali preko tima, ki pretvori posamezne odločitve v dejanja" (Senge 1990, 236). Zato je proučevanje opisane tematike in raziskovalnega vprašanja, kaj so dejavniki uspešnega timskega dela, še vedno zelo aktualno. V primerjavi s predhodnimi študijami o delovanju timov je danes v ospredju predvsem pomen socialnih povezav med člani tima, ki igrajo pomembno vlogo pri oblikovanju dinamike in uspeha timskega dela. V disertaciji nas je zato še posebej zanima vloga socialnih omrežij pri timskem delu.

Številni avtorji (Ancona 1990; Baldwin et al. 1997; Hansen 1999; Brown in Miller 2000; Reagans in Zuckerman 2001; Sparrowe in drugi 2001; Cummings in Cross 2003; Oh in drugi 2004; Henttonen in drugi 2010) so se v svojih raziskavah o vplivu socialnih omrežij na uspešnost timov osredotočili na različne mere socialnih omrežij (usredinjenost, moč vezi, gostota vezi, raznovrstnost omrežja, vezi zunaj in znotraj tima). Rezultati teh študij so pokazali, da številne mere omrežij vplivajo na uspešnost timov.

Timi so socialne mreže neformalnih odnosov med posamezniki in se razlikujejo glede na vrsto socialne vezi. V disertaciji smo proučili dve različni vrsti neformalnih socialnih povezav, ki se razlikujeta glede na vsebino: posvetovanje, kjer vezi med posamezniki služijo za dajanje in prejemanje ene vsebine povezav, to je nasvet in druženje, kjer posamezniki izmenjajo različne vire. Podolny in Baron (1997) razumeta vezi posvetovanja kot instrumentalne vezi, ki omogočajo dostopanje do informacij, med tem ko so vezi druženja bolj ekspresivne in služijo za prenos različnih virov, kot je družbena opora, prijateljstvo, politična podpora, informacije, emocionalna opora (Oh in drugi 2004). Kljub temu, da socialne vezi tako kot vezi posvetovanja omogočajo pretok informacij, moramo obe vrsti vezi nujno proučevati ločeno, saj se lahko njuni vzorci povezav močno razlikujejo.

V disertaciji timsko delo pojmujemo kot "delo, ki ga opravi samostojna skupina ljudi, ki se dogovori o sodelovanju, z namenom doseganja skupnega cilja in dlje časa deluje v medsebojnih interakcijah (lastna definicija). Za razliko od formalnih struktur poročanja, neformalne socialne povezave predstavljajo ad hoc odnose, ki jih člani organizacije sami tvorijo in z njimi tudi sami upravljajo (Cross in Parker 2004). "Če je formalna organizacija okostje družbe, je neformalna organizacija centralni živčni sistem, ki potiska kolektivne miselne procese, dejanja in reakcije poslovnih enot...Njegove zapletene mreže socialnih vezi se skozi čas utrdijo v presenetljivo stabilna omrežja, kadarkoli zaposleni med seboj komunicirajo. Visoko prilagodljiva, neformalna omrežja se premikajo diagonalno in eliptično, in preskakujejo posamezne funkcije, da svoje delo opravijo "(Krackhardt in Hanson 1993, 104).

V prvem delu doktorske disertacije smo podali celovit pregled prvih analiz timov in timskega dela z vidika organizacijskih teorij, poudarili vlogo neformalnih socialnih omrežij v organizacijah, definirali time z vidika socialnih omrežij, predstavili raziskave o socialnih omrežjih vodij timov in opisali temeljna načela socialnih omrežij kot nov pristop k razvoju človeških virov. Nato sledi pregled preteklih raziskav o socialnih omrežjih timov in vodij timov in predstavitev hipotez o vplivu različnih vzorcev povezav socialnih omrežij timov in vodij timov na uspešnost timov. V drugem delu doktorske disertacije smo opisali raziskovalni pristop in metodologijo, vključno z merjenjem socialnih omrežij, zbiranjem podatkov, opisom vzorca, postopka analize in problemom manjkajočih podatkov. V empiričnem delu smo analizirali demografske in organizacijske značilnosti članov timov in socialnih omrežij timov in vodij timov z uporabo različnih metod analize podatkov (kvalitativne in kvantitativne metode, vključno z metodo analize socialnih omrežij in statistične bivariatne in multivariatne analize). Vsebine vezi in viri, ki se izmenjujejo prek neformalnih socialnih vezi, so opisani v posebnem poglavju. V analizo smo vključili posebej slovenske in finske time, prav tako smo vodjem timov in njihovim socialnim omrežjem posvetili samostojno poglavje. V zadnjem delu smo predstavili splošne ugotovitve iz naše raziskave o vlogi socialnih omrežij pri timskem delu in preverili ali predpostavljene hipoteze o socialnih omrežjih timov in vodij pojasnjujejo faktorje uspešnega timskega dela. V zaključku podamo tudi značilnosti uspešnih slovenskih in finskih timov in njihovih vodij. Disertacijo zaključimo z diskusijo in razlago znanstvenega prispevka doktorske disertacije za organizacijsko teorijo na področju socialnih omrežjih in manjših skupin.

Na podlagi teoretskih predpostavk in zastavljenih raziskovalnih vprašanj smo oblikovali sedem ključnih hipotez, ki so bile podlaga za empirično proučevanje povezave med socialnim omrežjem in uspešnostjo timskega dela. S prvo hipotezo (H1a) smo predpostavljali, da je visoka stopnja kohezivnosti v omrežju posvetovanja pozitivno povezana z uspešnostjo tima. S primerjavo treh različnih ravni uspešnosti slovenskih timov (visoka, zmerna in nizka) smo pokazali, da je kohezivnost najbolj statistično značilen pojasnjevalni dejavnik uspešnosti tima, tudi ko kontroliramo po velikosti tima. Rezultati analize potrjujejo našo hipotezo H1a. Kohezivni timi, kjer so člani timov med seboj povezani z močnimi vezmi, so bolj uspešni. Pokazal se je tudi šibek, vendar statistično značilen in pozitiven vpliv staža v timu (team tenure) na uspešnost tima. Timi katerih člani so dalj časa skupaj so bolj učinkoviti.
Vpliv stopnje kohezivnosti na uspešnost tima smo preverili tudi v omrežju druženja. Druga hipoteza (H1b) tako predpostavlja, da je visoka stopnja kohezivnosti vezi v omrežju druženja pozitivno povezana z uspešnostjo tima. Rezultati naše raziskave so pokazali, da kohezivnost povezav v omrežju druženja, ko kontroliramo velikost tima, ni statistično značilno povezana z uspešnostjo slovenskih timov. Za uspešne finske time iz naše raziskave pa je značilna nizka stopnja kohezivnosti v omrežju druženja in šibke povezave med njihovimi člani in zato hipoteze H1b ne moremo potrditi.
S hipotezama H2a in H2b smo skušali preveriti, ali je nizka stopnja usredinjenosti omrežja posvetovanja in omrežja druženja pozitivno povezana z uspešnostjo tima. S primerjavo dveh ravni uspešnosti timov (bolj in manj) smo ugotovili, da stopnja usredinjenosti, ko kontroliramo velikost tima, nima statistično značilnega vpliva na uspešnost slovenskih timov in ne finskih timov (korelacije), zato hipotez H2a in H2b ne moremo potrditi.
S hipotezo H3 smo preverjali raznolikost timov in njen vpliv na uspešnost timov. Koncept raznolikosti timov smo operacionalizirali z mero velikosti tima in vezmi, ki jih imajo člani tima

z drugimi timi in drugimi vodji timov. Rezultati primerjalne analize med bolj in manj uspešnimi skupinami timov so pokazali, da so vezi zunaj tima najbolj pomembna mera raznolikosti timov, tako v slovenskih, kot tudi finskih timih. Bolj uspešni finski timi imajo več vezi v omrežju druženja z drugimi timi in vodji timov, medtem ko imajo bolj uspešni slovenski timi več vezi v omrežju posvetovanja z drugimi vodji in več vezi v omrežju druženja z drugimi timi in vodji timov v primerjavi z manj uspešnimi timi. Hipotezo lahko delno potrdimo. Uspešni timi imajo večjo stopnjo raznolikosti pri vzpostavljenih vezeh zunaj meja tima in povezujejo tim s širšim organizacijskim kontekstom.

V hipotezah H4a in H4b smo se osredotočili na omrežja vodij timov in predpostavljali, da so timi z vodji, ki zavzemajo prestižni položaj v omrežju posvetovanja, bolj uspešni in da so timi z vodji, ki zavzemajo prestižni položaj v omrežju druženja, prav tako bolj uspešni. Rezultati analiz so pokazali, da vodje v najmanj uspešnih timih, kot tudi v najbolj uspešnih timih, zavzemajo prestižni položaj v timu, je pa majhna razlika v stopnji prestiža v korist vodij bolj uspešnih timov. Zato lahko hipotezi H4a in H4b potrdimo. Vodje, ki zavzemajo središčni položaj v omrežju posvetovanja, svojo formalno moč dopolnjujejo z neformalno močjo in tako dostopajo do različnih podatkov in virov, kar ima pozitiven vpliv na uspešnost tima. Prestižno pozicionirani vodje timov so značilni za uspešne time. Vodje, ki zavzemajo središčni položaj v omrežju druženja imajo pregled nad socialno strukturo tima, kar jim omogoča boljše sprejemanje odločitev.

Doktorska disertacija je pomemben prispevek na področju proučevanja majhnih skupin in socialnih omrežij. V raziskavo o socialnih omrežjih timov smo vključili dve različni vrsti neformalnih socialnih vezi, vezi posvetovanja in vezi druženja in tako proučili povezavo med kohezivnostjo omrežja in uspešnostjo tima v različnih kontekstih povezav. Disertacija nadgrajuje dosedanje raziskave na področju socialnih omrežij timov, ki so se osredotočale predvsem na eno izmed vezi v neformalnem socialnem omrežju (Baldwin in drugi 1997; Reagans in Zuckerman 2001; Oh in drugi 2004; Henttonen in drugi 2010). Proučili smo različne vsebine, ki se izmenjujejo v omrežju druženja med člani timov. S tem smo razvili bolj dinamični vpogled v socialna omrežja timov in ugotovili, katere vrste vezi služijo za določene vrste virov, kot so predlagali Mehra in drugi (2006). V disertaciji smo podrobneje proučili določeno vrsto vezi, neformalne vezi druženja, v kulturnem kontekstu (Finska), kjer druženje izven delovnega mesta ni vzpostavljeno kot kulturna norma. Disertacija je pomemben prispevek tudi k teoriji vodenja. Z osvetlitvijo aspekta socialnih vezi tako timov kot tudi njihovih vodij smo proučili vlogo notranjih in zunanjih vezi za uspešno delovanje in vire, ki jo vodje nudijo članom njihovih timov. Z metodološkega vidika, disertacija pomembno zapolnjuje vrzel pri obravnavanju manjkajočih podatkov. Nudi širok pregled različnih metod nadomeščanja manjkajočih podatkov pri analizi socialnih omrežij in napotke za čim boljšo pripravo vprašalnikov in matrik za omrežja povezav. Pomemben prispevek disertacije posega tudi v izboljšanje organizacijskih praks. Ugotovitve naše raziskave kažejo, da različni vzorci socialnih omrežij timov, poleg velikosti in staža v timu, pri timskem delu igrajo pomembno vlogo.

Ključne besede: timsko delo, socialna omrežja timov, socialna omrežja vodij timov, analiza socialnih omrežij, učinkovitost timov, vsebina vezi, slovenski timi, finski timi.

The Role of Social Networks in Teamwork

Abstract

The main concern of this doctoral thesis is the concept of teamwork and the factors underpinning the success of teams. Teamwork is a not a new phenomenon since it has been the subject of analysis in the sociology of organisations and sociology of work for more than 50 years. Research on teams is especially interesting today because "almost all important decisions are now made in teams, either directly or through the need for team to translate individual decisions into action" (Senge 1990, 236). This explains the continuing relevance of this phenomenon and the research question examining the factors of successful teamwork. In comparison to how teams were studied in past research, the approach has changed and now concentrates more on the meaning of the social relationships among team members that play an important role in the dynamics and success of team work. We were particularly interested in the role of social networks in team work.

In their studies on the influence of social networks on team performance, different researchers (Ancona 1990; Baldwin 1997; Hansen 1999; Brown and Miller 2000; Reagans and Zuckerman 2001; Sparrowe et al. 2001; Cummings and Cross 2003; Oh et al. 2004; Henttonen et al. 2010) focused on different network measures (centralisation, strength of ties, density, network diversity, bridging ties). Their results show that a variety of network measures influence the success of teams.

A team is a social network of interpersonal relations and varies according to the type of social ties involved. In this dissertation we focus on two different types of informal social ties – single resource advice ties and more comprehensive socialising ties – through which team members exchange a variety of different resources. According to Podolny and Baron (1997), advice ties are more instrumental ties and allow access to work flow information, while socialising ties are more expressive ties and transmit multiple resources like social support, friendship, political support, information, emotional support (Oh et al. 2004). Even though both advice networks and socialising networks provide access to information, we need to study the two types of ties separately since they can differ in terms of their patterns.

In the dissertation we define teamwork as "work done by an autonomous group of people, agreed on working together, aiming at the same goal and in constant interaction for some time" (author's own definition). Unlike formal reporting structures, informal social relationships represent ad hoc relationships that are self-generated and self-managed by organisational members (Cross and Parker 2004). "If the formal organization is the skeleton of a company, the informal is the central nervous system driving the collective thought processes, actions, and reactions of its business units... Its complex webs of social ties form every time colleagues communicate and solidify over time into surprisingly stable networks. Highly adaptive informal networks move diagonally and elliptically, skipping entire functions to get work done" (Krackhardt and Hanson 1993, 104).

In the first part of the doctoral thesis, we present a comprehensive overview of the first analyses of teams and teamwork in organisational theory, the role of informal social networks and the basic principles of social network analysis. We define teams from a social network perspective and present a research review of social networks of team leaders. Based on previous network research findings, we hypothesise the influence of different patterns of teams' and team leaders' social networks on team performance. In the second part of the dissertation, we describe the research methodology, sample, procedure and data collection in the Slovenian and Finnish teams, the missing data problem and the operationalisation of measures for the data analysis. In the empirical part, we present and test the research model for measuring the impact of teams' and team leaders' demographic/organisational characteristics and social networks on team performance. The social networks of team leaders and the resources that are exchanged through informal social ties among all team members are described in a special chapter. We analyse the Slovenian and Finnish teams and their team leaders separately. In the conclusion, we present the general findings of our research and consider whether the proposed hypotheses on the social networks of teams and team leaders contribute to the explanation of the factors of successful teamwork. We conclude with a discussion and the scientific contributions of the doctoral thesis to organisational theory on social networks and small groups.

Based on the theoretical assumptions and our research question, we have developed seven hypotheses in order to be able to empirically examine the relationship between social network and team work effectiveness. The first hypothesis (H1a) suggests that a higher level of cohesion in a team's advice network is positively associated with team performance. The results of our analyses show that cohesion, measured as density with valued ties, is the most significant predictor of team effectiveness in the Slovenian teams, even when we control for the teams` demographic and organisational characteristics. We can therefore confirm this hypothesis. The second hypothesis (H1b) suggests that a higher level of cohesion in a team's socialising network is positively associated with team performance. However, the results of the analyses of the Slovenian and Finnish teams show that cohesion in a team's socialising network, when we control for the team`s size, is not significantly related to team effectiveness. The influence of size is stronger than the influence of cohesion indicating that smaller teams are in the socializing networks more effective. Therefore, this hypothesis could not be confirmed.

Hypotheses H2a and H2b propose that a lower degree of centralisation in a team's advice and socialising network is positively related to team performance. The results indicate that the degree of centralisation, when we control for the team`s size, has no significant impact on the effectiveness of the Slovenian teams. The influence of size is again stronger than the influence of the social networks (centralisation). The successful Finnish teams are on the other hand characterized by a higher level of centralisation, so we cannot confirm hypotheses H2a and H2b.

Hypothesis H3 proposes that the network diversity of teams is positively associated with team performance. We define the network diversity of teams in terms of team network size and social ties to other teams and other team leaders. The results of our multivariate analysis show that team performance decreases with size therefore size does not positively contribute to the team`s network diversity. However, the results of group comparison

approach indicate that bridging social ties seem to be the most important measure of network diversity in both the Slovenian and Finnish teams. High performing Finnish teams have more bridging socialising ties to members of other teams and other team leaders, while high performing Slovenian teams have more bridging advice ties to other team leaders. We can therefore partly confirm this hypothesis.

The last two hypotheses (H4a and H4b) suggest that teams with leaders who hold a prestigious position in the team's advice network and team's socialising network perform better. The results of our analysis show that leaders of high and low performing Slovenian teams both hold a prestigious position in the team, but there is a slight difference in favour of the leaders of high performing teams. The leaders of Finnish teams only hold a central position in the team's advice networks. Hypothesis H4a can be confirmed for the leaders of the Slovenian and Finnish teams, but hypothesis H4b can only be supported for the leaders of the Slovenian teams. The main findings of our research on the Slovenian and Finnish teams suggest that different patterns of social networks (cohesion, bridging ties, leader's centrality) are as important for successful work in teams as the organisational characteristics of the teams (team size, team tenure).

This doctoral dissertation contributes to the small group literature and network theory in several ways. In the research on social networks of teams we incorporated two different types of informal social ties, advice and socialising ties, to examine the extent to which the type of tie influences the relationship between team cohesion and team performance. The dissertation contributes to the research on social networks of teams by upgrading the previous studies that chiefly focused on one type of informal social tie (Baldwin et al. 1997; Reagans and Zuckerman 2001; Oh et al. 2004; Henttonen et al. 2010). This dissertation also adds to the research on social networks of teams by developing a more dynamic view of precisely which types of ties convey which kinds of resources as proposed by Mehra et al. (2006). Another important scientific contribution of this dissertation relates to the study of informal socialising tie in a more individualistic cultural environment like Finland where socialising after work is not an established cultural norm as in other countries. This dissertation also contributes to leadership theory by shedding light on the social relationship aspect of leadership and focusing on the specific configuration of team leaders' social network ties, internal (bonding) and external network ties (bridging ties), and the support leaders provide to members of their teams. We contribute to a better understanding of the leader's structural position in the team's overall social structure and its implications for the performance of teams. The dissertation also holds important methodological implications for the missing data problem and contributes to the methodology of social network analysis by providing a comprehensive overview of different imputation techniques on how to treat missing data when analysing social networks. The final purpose of doctoral dissertation is to help improve organisational practices through a precise analysis of team performance and teamwork success.

Key words: teamwork, social networks of teams, social networks of leaders, social network analysis, team performance, tie resources, Slovenian teams, Finnish teams.

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1   INTRODUCTION

The main concern of this doctoral thesis is the concept of teamwork and the factors behind the success of teams. Teamwork is a not a new phenomenon since it has been the subject of analysis in the sociology of organisations and sociology of work more than 50 years and is still relevant in the present research. This is mostly due to current organisational challenges focusing on complex and multidisciplinary knowledge based work processes, the need for faster organisational changes, an ever more educated and heterogeneous work force and fast changing technology in modern workplaces. Research on teams is today especially interesting because "almost all important decisions are now made in teams, either directly or through the need for team to translate individual decisions into action" (Senge 1990, 236).

The main research interest is still oriented to the successful performance of teams but, compared to the study of teams in the past, the research focus has changed and is now more concentrated on the meaning of social relationships among team members. In the dissertation, we understand team as a social network of interpersonal relations and teamwork as "work done by an autonomous group of people, agreed on working together, aiming at the same goal and in constant interaction for some time" (author's own definition).

Social networks represent patterns of informal relations among individuals and differ according to the type of social tie. In the dissertation we focus on two different types of informal social ties, single resource advice ties and more comprehensive socialising ties, through which team members exchange a variety of different resources. According to Podolny and Baron (1997), advice ties are more instrumental ties and allow access to work flow information, while socialising ties are more expressive ties and transmit multiple resources like social support, friendship, political support, information, emotional support (Oh et al. 2004). The pattern of teams' advice networks can vary greatly compared to the pattern of teams' socialising networks. Social networks of teams also differ according to the nature of teams' work. Different types of teams can have various patterns of social networks.

Unlike formal reporting structures, informal social relationships represent ad hoc relationships that are self-generated and self-managed by organisational members (Cross and Parker 2004). "If the formal organization is the skeleton of a company, the informal is the central nervous system driving the collective thought processes, actions, and reactions of its business units...Its complex webs of social ties form every time colleagues communicate and solidify over time into surprisingly stable networks. Highly adaptive, informal networks move diagonally and elliptically, skipping entire functions to get work done" (Krackhardt and Hanson 1993, 104). The structural approach to the study of organisations, while exploring the communication patterns within organisations and their smaller units, groups and teams, provides important insights into the operating principles of organisations and their structural elements. Looking at the organisation as a natural system (Scott 2000), the informal structure of relations that develops among participants provides a more informative and accurate guide to understanding organisational behaviour than the formal structure. "It is through these informal networks – not just through traditional organizational hierarchies – that information is found and work gets done" (Cross and Prusak 2002, 105).

Social networks hold important implications for the performance of teams as well as the performance of individual team members, so we analysed relational networks in organisational teams at two levels; at the macro level, where the structure of relations limits or facilitates the capacity of teams to act, and at the micro level, where the focus is on individuals, leaders and their relations to others inside the team and inside the organisational environment. This approach to organisational networks is the basis of social network analysis (Nohria and Eccless 1992). Social network analysis provides very useful tools for exploring organisational and team processes by revealing strategic social networks that can help us better understand the structure of interpersonal relations. When looking at relational networks on the micro level, social networks provide individuals with the ability to influence other employees (Oh et al. 2004). Leaders have a great influence on team dynamics and team performance, they can accelerate team processes and hold direction or they can exacerbate teams. Team leaders' social networks influence the network structure of team members, especially if teams are very cohesive and the members well connected.

There are few studies on the social networks of team leaders so the topic has yet to be more thoroughly examined and there is thus a lot of research potential.

The main research question in the dissertation involves identifying the factors of successful teamwork. To explain whether different patterns of social networks have a greater impact on the performance of teams than team members' demographic and organisational characteristics, we apply concepts and theoretical approaches that are currently used as effective instruments of sociological analysis, with a special focus on social network analysis. To give an answer to the main research question, we analyse teams from the following social network perspectives:

1. What particular pattern of advice and socialising network structure makes teams more effective?

2. Are effective teams characterised by greater network diversity?

3. How do the social networks of the leaders of high and low performing teams vary according to the type of tie (advice vs. socialising ties)?

In order to explain the abovementioned network perspectives, we combined different methodological approaches. Data on team members' social networks were gathered with the help of a sociometric survey (Stork and Richards 1992), partly as field work and partly in the form of a web survey questionnaire. We analysed data by applying quantitative methods such as social network analysis and statistical analysis (bivariate and multivariate analysis) and qualitative methods such as a group comparison approach.

The major part of our field study on social networks of teams was performed in Slovenian organisations and companies. A small part of the empirical research was carried out in Finnish organisations. We included Finnish teams in the research for two reasons. The first is that there plenty of research exists on teamwork in Finland (European Foundation 2010; Lehto and Sutela 2009). Results of a survey carried out by the European Foundation (Kyzlinková et al. 2007) reveal that Finland is an example of good practice in teamwork, where team members have a high level of team autonomy, better access to education and more opportunities to gain new knowledge. Employees working in teams are also more

satisfied with working conditions and less exposed to working pressures. The second reason is that we had a possibility to perform the field work at the University of Helsinki. Therefore, we conducted research in different private and public Finnish organisations under the supervision of Professor Vesa Taatila from the Laurea University of Applied Sciences. Although the purpose of this doctoral thesis is not a cross-cultural study, we think that examining the social networks of teams in two very different cultural and organisational settings, Slovenia and Finland, contributes to a better understanding of the role social networks play in teamwork.

In the first part of the doctoral thesis, we present a comprehensive overview of the first analysis of teams and teamwork in organisational theory and the role of informal social networks, define teams from a social network perspective, give a review of past research on social networks of teams and team leaders and describe the basic principles of social network analysis as a new approach to HRD. Based on previous network research findings, we hypothesise the influence of different patterns of teams' and team leaders' social networks on team performance. In the second part of the dissertation, we describe the research methodology, sample, procedure and data collection in Slovenian and Finnish teams, the missing data problem and the operationalisation of measures for the data analysis. In the empirical part, we present a research model of measuring the impact of teams' and team leaders' demographic/organisational characteristics and social networks on team performance, separately for the team advice and team socialising networks, and test the research model and proposed hypothesis by applying bivariate analysis (correlations and group/leader comparison approach) and multivariate (regression) analysis. The social networks of team leaders and the resources that are exchanged through informal social ties among team members are described in a special chapter. We analyse the Slovenian and Finnish teams separately. In the conclusion, we present the general findings of our research and highlight whether the proposed hypotheses on the social networks of teams and team leaders contribute to the explanation of the factors of successful teamwork. We conclude with a discussion and the scientific contributions of the doctoral thesis to organisational theory on social networks and small groups.

2 THEORETICAL BACKGROUND AND HYPOTHESES

2.1 First analysis of teams and teamwork in organisational theory

Businesses are today increasingly using teams "as their fundamental organizational units" (Henttonen et al. 2010, 388). The concept of teamwork has been steadily promoted since the 1960s with the "autonomous groups" from the car industry, Taylor's work divisions and the Japanese total quality management approach having a significant impact on the development of teamwork. The emphasis on flexible, team-based organisation came to prominence in the 1980s and 1990s in response to the need to find other non-mechanical ways of organising (Morgan 1997, 31).

In 1988, Drucker acknowledged that "although teams within organisations are hardly new, they have recently gained importance as a fundamental unit of organisational structure". Since then, more than 30 years have passed and research interest in teams is still growing. The difference compared to the study of teams in the past is that the research focus has changed.

Team researchers used to identify classical team variables that predict the effectiveness of a team such as cohesiveness, size, leadership, motivation, group goals (Guzzo and Dickson 1996) and the composition of a team, particularly as regards team diversity. Recently, the concept of teams and social networks began to converge and research is now focused on the meanings of different social ties among team members for the performance of teams (Katz and Lazer 2003) and team viability (Balkundi and Harrison 2006).

The work performed by teams is distinguishable from the work of individuals because of the skills and experience team members bring in together which exceed that of any particular individual. Members become strongly interdependent partners in a team, not only for information and knowledge, but also for mutual support, advice and assistance. Group dynamics have the potential to drive organisational changes and consequently increase the performance, motivation and business excellence of a company.

Woodcock and Francis (1994, 1) distinguish between a group and a team since not all groups are teams. "A team is defined as a group of people who must directly relate together. Shared

objectives are crucial: unless members have a common purpose there is no basis for teamwork". Teams are characterised by four dimensions; the decision-making process (empowerment of all team members, new ways of solving problems); the nature of the work (task and cost of work sharing); the size of a team (the optimum is 5–12 members); and the role of the leader who should be skilled in conflict situations and flexible in times of change (Možina and Kovač 2006).

Teams are usually composed of mixed knowledge, insights and skills as well as characters, values, roles and functions (Mayo and Lank 1996). When people work together they have certain needs like effective communication, active listening, trust, openness, successfully resolving the conflicts that inevitably arise when people work in groups, adapting to other members and a sense of motivation (Chang 1995). Trust is based on social relationships (Uzzi 1997) and represents one of the key resources shared among team members. According to Levi (2007), trust has a direct relationship with interpersonal communication, cooperation and teamwork. When people devote themselves to developing and maintaining their relationships, cooperation and trust increase. In teams with a high level of trust, several other things occur that support teamwork, like the free exchange of information, increased participation in the team's activities and higher commitment to group goals (Levi 2007). When team members trust each other the level of satisfaction with the teamwork increases. Members who are satisfied with the communication within the team and the way the team functions are more willing to help other team members and more devoted to the team's success.

Today's organisations are often multi-project environments in which teams constitute a major part of the business. Large projects bring people from different parts of the organisation together and hence establish a diversity of connections between project members. Teams which draw members from diverse demographic categories benefit because such teams generate links between people with different skills, information and experience, and enjoy an enhanced learning capability and capacity for creative problem solving (Reagans and Zuckerman, 2001). When team members spend some time together, the team becomes more cohesive, conflict is reduced and levels of trust and support increase. "Every team goes through different development stages, alternative theories

explain this group process changes as cycles, and every team needs time to define its goals, establish some ground norms and develop social relations" (Levi 2007, 38–39). But, in contrast, some researchers argue that after a few years longevity is no longer a benefit for the team (Guzzo and Dickson 1996) so team performance worsens with age (Kratzer et al. 2005). Another important element that can influence team dynamics and performance is team size (Hare 1981). According to Levi (2007), a team is composed of 4 to 20 people who interact with one another directly. Katzenbach and Smith (2004) say that a team should be limited to a fairly small number of people because it is more pragmatic for constructive interaction and logistical issues. But although larger teams tend to be less cohesive and less productive, "they also have more members who can give them bridging ties which bring new knowledge and can provide teams with strategic positions" (Oh et al. 2004, 867).

Teams in organisations also differ regarding the nature of their work. Cohen and Bailey (1997, 241–243) describe four different types of organisational teams: work, parallel, project and management teams. Work teams are typical organisational teams responsible for the production of goods or for providing services. Work teams have stable, usually full-time membership and are well-defined. They are directed by supervisors who make the most important work-related decisions. According to Cohen and Bailey (1997), an alternative form of work team, called the self-managing or autonomous team, is gaining favour. Employees in self-managing teams are involved in the decision-making process and are more empowered. Parallel teams, also called quality circles or task forces or quality improvement teams, consist of members from different work units or jobs who perform the daily work. The main purpose of parallel teams is to make recommendations to higher level managers. Their activities consist of problem-solving and improvement-oriented activities. Project teams are time-limited. They usually produce a one-time output such as a new product or service. The work of project teams is complex and involves knowledge, judgment and expertise. Members of project teams come from different departments (marketing, engineering, manufacturing) and work on improving existing concepts or developing new ideas. Management teams are the most empowered teams, they coordinate and provide direction to the sub-units and are responsible for the overall performance. They are composed of managers from different departments. Cohen and Bailey (1997) stress that the use of top

management teams, which establish the company's strategic direction and manage its performance, is increasing.

Although teamwork is not the only solution for organisational survival or a condition of its success, a number of researchers have reported the positive results of teamwork (Guzzo and Dickson 1996; Katzenbach and Smith 2004; Sundstrom et al. 1990) and so interest in the search for different ways to enhance team performance has increased.

Some authors define team performance as team effectiveness and described more effective teams as more productive (Cohen and Ledford 1994), more cooperative (Kirkman and Rosen 1997) and more empowered (Fisher 1993). Kirkman and Saphiro (2001), on the other hand, defined team effectiveness as a construct of those three team qualities; team productivity, cooperation and empowerment. Team productivity represents the extent to which a team meets or exceeds team goals, completes tasks on time, makes sure that products and services meet or exceed production standards, and responds quickly to problems; team cooperation is the extent to which team members are willing to share information with other team members about their work, the team enhances the communication among people working on the same product and members cooperate to get the work done; and team empowerment as the extent to which the team has confidence in itself, the team can select different ways to do the team's work and the team believes that the team's work is valuable and makes a difference to the organisation.

The determinants of team performance have attracted a lot of research attention, but the research focus so far has been more on formal relationships than informal interaction patterns (Guzzo and Dickson 1996) and social networks were often not included in the critical set of determinants (Balkundi et al. 2006). For a better understanding of the success of teams, Henttonen et al. (2010, 388) suggest "we need to develop a deeper understanding of how structural characteristics" of social (informal) relations in teams relate to team performance and we therefore present organisational teams from a social network perspective.

2.2 Teams from a social network perspective

Social networks are important for understanding the context of teams because when members participate in a team they bring ties with them that they have with other people, inside and outside the organisation. The pattern of social ties "creates a network of interdependent relations where certain people become trusted exchange partners" (Rosenthal 1997, 290). With teamwork, interpersonal ties connect team members and through these informal ties, information, knowledge, ideas and decisions are spread more rapidly than via most other, formal kinds of communication channels (Kovačič and Lužar, 2011).

Much research in the past (Weber 1930; Page 1946; Simon 1953; Gouldner 1954; Parsons 1956) was devoted to formal social ties inside organisations, yet not all interactions of their members are strictly official. Already in the 1970s, Blau and Scott (1963) argued that in every formal organisation informal organisations also arise as complex networks of social relations and informal status structures within groups and between them. The most famous example of early research on informal organisations was the Hawthorne experiments carried out by Roethlisberger and Dickson (1934) in the Western Electric Company in Chicago. The focus of early experiments was on the effects of varying degrees of illumination on worker productivity. Productivity increased in two of the three departments, regardless of the changes in illumination. After conducting a few more experiments, the final conclusion was that increased productivity was a function of improved human relations. This was the beginning of the Human Relations Movement that later resulted in the creation of the discipline of human resource management. The founder of the Human Relations Movement, George Elton Mayo, conducted research within the Hawthorne Studies and showed the importance of groups in affecting the behaviour of individuals at work. The Hawthorne Studies were also the first to use sociograms[1] to diagram the structure of social interactions, so "from the very beginning social network analysis had its roots in organizational settings"

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[1] A sociogram is a visual display of all nodes and ties in a network (Katz et al. 2004).

(Kilduff and Tsai 2003, 14). The discovery of informal group processes in organisational settings stimulated the study of small group behaviour (Homans 1950; Whyte 1951; Likert 1958).

There is ever stronger awareness of the importance of informal structures in the modern approach to organisations. An informal structure of relations evolves inside the formal organisation and creates informal norms, behavioural patterns, informal status and power systems, communication networks and working arrangements. The modern approach to organisations is best presented by Scott (2003) who defines organisations as a rational system with a highly formalised social structure, as a natural system with an informal structure of relations and as an open system that is open to flows of resources and information from the outside environment. Among all three definitions, the natural system is the most important because »the informal structure of relations that develops among participants is more influential in guiding the behaviour of participants than is the formal structure« (Scott 2003, 28). Nohria and Eccles (1992, 5) describe informal relations as "hidden networks" and, because formal relations do not entirely capture an organisation's network, identifying and analysing these networks can be very helpful for understanding organisations. Informal networks of relationships account for regularities in the daily routine, distinguish effective from ineffective individuals and groups and generally provide key channels for business to get things done (Ibarra 1992).

As practitioners, Davenport and Prusak (2000) say that much of the work in the firm gets done because people continually ask one another who are experts for specific work tasks. Informal networks benefit because they function through the personal contact of people who are more or less in constant interaction with each other and, when the conditions change, they tend to update themselves. »People share information about who has left the company or moved to new projects and who has recently became useful source of knowledge« (Davenport and Prusak 2000, 37–38). The main disadvantage of informal social networks is that they are not available to everyone who needs them since they are informal and undocumented.

From a network perspective, all organisations are in an important respect social networks and need to be addressed and analysed as such and, secondly, the actions of actors in the organisation are best explained in terms of their positions in networks of relations (both formal and informal) at any levels of analysis – small and large groups, sub-unit of organisations, entire organisations, regions, or industries (Nohria and Ecless 1992).

A social network consists of a set of actors ("nodes") and the relations ("ties" or "edges") between these actors (Wasserman and Faust 1994). The social network analysis approach reveals the dynamics of the interaction between actors and the ability to measure relationships helps to define existing behaviours and the impact they might have on an individual's capability to function among others (Hatala 2006, 50). The goal of network analysis is to create a useful description of a system of relationships from raw relational data (Stork and Richards 1992). Social network analysis (SNA) is also a set of analytical tools that map networks of relationships and provide an important means of assessing and promoting collaboration in strategically important groups (Cross et al. 2003). Different forms of connections create different social networks. The same sample can in addition be used to measure different connections among research units, also called "nodes", their communication network, personal preferences, relations of power etc.

Katz et al. (2004) reviews the growing body of literature at the intersection of groups and networks and argues that the network approach can provide a deeper insight into the dynamics and performance of small groups. The basic idea of the social network perspective is that the structure of social interactions enhances or constrains access to valued resources (Brass 1984; Sparrowe et al. 2001) and the achievement of specific organisational objectives (Kilduff and Tsai 2003).

The network of relations was first mentioned already in the 1940s by the anthropologist Radclife-Brown as the interaction patterns describing a social structure. Social psychologist Jacob Levy Moreno (1934) was the first to draw a picture of the connections among a specified group of people. He also envisaged mapping the entire population of New York City (Cross et al. 2003). Network research differs from the traditional approach to the social

sciences in three ways; firstly, the focus is on relations and the patterns of relations rather than on the attributes of actors; secondly, network research can be performed at multiple levels of analysis (micro such as the individual level and macro such as the network level); and, thirdly, network research can integrate qualitative, quantitative and graphical data, which allows a more in-depth analysis (Kilduff and Tsai 2003).

The key building block of network research is a tie, which in research is often based on communication, such as task-related communication, advice-related communication and social communication. Some research shows (Kilduff and Tsai 2003; Balkundi and Harrison 2006) that connectedness may facilitate increased resource sharing and collaboration, while disconnectedness signals a division in a social system and limits the organisation's ability to integrate the expertise from the team members (Kilduff and Tsai 2003). Organisations have used social network analysis to improve their strategic decisions, promote innovation, and develop communities of practice (Wasserman and Faust 1994; Cross and Parker 2004). The central idea of network analysis is that people's beliefs, feelings and behaviours are driven by the patterns of relationships among individuals. Informal social relations can be based on specific ties or can be conversational relationships within and across an organisation's formal boundaries. Social network theory distinguishes between social ties that differ regarding the tie content (friendship, advice, communication, work), what flows through them (resources, information, affection), or whether they are strong or weak, unitary or multiplex.

Past social network research has identified two broad classes of workplace ties: instrumental ties, which convey work-related resources, and expressive ties, such as friendship ties that transmit social support (Mehra et al. 2006). Instrumental and expressive ties often overlap in practice. Instrumental ties involve the exchange of job-related resources like information, expertise, professional advice, political access and material resources and, although instrumental networks overlap with formally prescribed relationships, they are not limited to them (Ibarra 1993). Instrumental ties are weaker ties and link people who differ in personal characteristics, their positions in the hierarchy, or in their access to important resources (Ibarra and Andrews 1993). Expressive ties involve the exchange of friendship and social support and are characterised by higher levels of closeness and trust than instrumental ties.

Friendship ties tend to be stronger and connect people who are similar and in more frequent interaction (Krackhardt 1990). Friendship networks are "systems for making decisions, mobilising resources, concealing or transmitting information and performing other functions closely allied with work behaviour and interaction" (Lincoln and Miller 1979). In their study, (Mehra et al. 2006) found that organisational members used their friendship ties to access both expressive resources (confidence building, other emotional support) and instrumental resources (advice on how to access new customers).

Podolny and Baron (1997) developed a typology of single-resource ties in which some ties like strategic information ties provide access to important future decisions, task advice ties allow access to work flow input and output, friendship ties transmit personal support and "buy-in" ties allow access to performance feedback. In their research, Podolny and Baron (1997) focused on a special type of social tie, a mentorship tie that on one hand transmits work-related resources and, on the other, extends to the personal realm. Social ties are in practice often multiplex ties that transfer a number of resources. Two team members can at the same time be work partners and friends. Multiplex relations are considered to have greater tie strength. The more relationships link one individual to another, the stronger the link (Granovetter 1973). Multiplexity of ties and density of a network are both indicators of network cohesiveness. Multiplexity is an indicator of tie intensity between an individual and others, while network density represents the intensity of relationships among different individuals in a network (Iglič 1988). Multiplexity also shows the extent to which two people are bound to each other in different social arenas, like colleagues at work, friends on the weekend and teammates in sports (Kilduff and Tsai 2003).

"Qualitative research on relationships in the workplace indicates that as a social tie strengthens, the relationship moves from being centered solely on instrumental, work-related purposes to having more expressive/affective elements" (Oh et al. 2004, 862). These types of ties provide access to multiple types of resources. When team members spend some time together and their relationships develop and broaden, work-related ties transform into more comprehensive, socialising ties, that encompas a variety of resources like social support, political support, strategic information etc. A shift in physical settings

outside the workplace, like going out to dinner or for drinks or sport activities, leads to a shift in the types of resources transferred through these ties (Feld 1981). Informal socialising ties can increase the level of trust between team members, provide an opportunity to strengthen the relationships and help individuals and teams to perform effectively. In some cultures, like Asian ones, informal socialising relationships are very important. Socialising with co-workers has been established as an informal requirement for being an effective worker and "norms have developed whereby workers engage in social activities outside of the workplace, mostly centered on eating and drinking" (Oh et al. 2004, 862). Other network research on socialising outside of organisations (Ibarra 1992; Ibarra and Andrews 1993; Mehra et al. 2001) has found that informal socialising relationships are also important in other cultures, like the Western business culture. Mehra et al. (2001) found that employees in a US high-technology company who had a higher number of informal socialising ties with co-workers were evaluated as higher performers than those who did not spend their free time with their co-workers. When controlling for the number of bridging ties, Mehra et al. (2001) discovered that employees who socialised with employees from diverse social circles inside the organisation were even more successful. In their research, Ibarra and Andrews (1993) found that employees who are central to an informal socialising network in the organisation perceived less interdepartmental conflict than less central employees. All of these results indicate that informal socialising ties carry a wide variety of resources that can positively impact the performance.

An important distinction in social network theory is made between strong and weak ties, assuming that stronger ties carry more trust and reciprocity than weaker ones. Putnam (2000) classified strong and weak ties as "bonding" and "bridging" forms of social capital. Bonding social capital represents close relations between family members and friends and creates dense network structures, which carry trust but also impose strict social norms. In contrast, the bridging form of social capital connects members of one network to members of another network and gives access to resources and opportunities that exist in both networks.

According to Taatila et al. (2006), social networks are also important in the context of the innovation process. When a new idea is being developed, people form into a social structure that is used for developing the innovation. The authors suggest that an "innovation idea is formed by a social network which 'concentrates' the network knowledge via one or more central persons called 'the innovators'" (Taatila et al. 2006, 319). Social networks therefore represent a channel through which the knowledge and skills accumulated in the whole research experience of the network members transforms into the innovation (Taatila et al. 2006).

Experimental work mid-last century showed that the structural arrangements of ties in groups may hold consequences for their productivity. A number of early scholars in the 1950s and 1960s focused on the association between different communication patterns (network ties) and performance (Bavelas 1950; Leavitt 1951; Guetzkow and Simon 1955; Shaw 1964). The results showed that in groups with simple tasks, centralised structures (wheels) improved the diffusion of information while decentralised structures (circles) delayed the diffusion of information. Shaw (1964) further demonstrated that groups with decentralised communication more quickly finished complex tasks than groups with centralised communication ties. According to Cummings and Cross (2003), early laboratory-based studies provide a good framework for assessing the impact of group communication structure on collective performance outcomes, but field research is needed to discover which structures have meaningful consequences for performance in real organisations. In field settings, information flow is emergent and depends on the skills and expertise distributed within a group.

The idea of centralisation as applied to human communication was introduced by Bavelas and co-workers in 1948. The communication networks that were observed varied in the way communication channels connected different positions in the network. Their studies revealed five different communication networks: completely connected, circle, chain, wheel and line. The wheel network is considered the most structured and has a linear structure with a central decision-making position. Communication runs quickly with unequal opportunities to communicate. In a completely connected network, in contrast, all members

communicate with each other, giving them equal opportunities to communicate. In the study of Bavelas (1948), team members in a completely connected network experienced a high level of overall satisfaction, but the decision-making process was slow. These first applications of network centralisation showed that centralisation is related to group effectiveness in problem-solving, the perception of leadership and the personal satisfaction of the participants.

According to Sparrowe and co-workers (2001) decentralised networks foster interdependence among team members which enhances cooperation, while in centralised networks exchange relations are concentrated among a few individuals. Less interdependence leads to less cooperation, the task domain decreases and the group performance suffers. Brown and Miller (2000) found that groups working on highly complex tasks tended to adopt a more decentralised communication pattern than groups working on a task of low complexity, while the results of a field study by Cummings and Cross (2003) showed that in groups with complex, non-routine work, a greater linear structure was negatively related to manager-rated and member-rated performance. Conti and Kleiner (1997) analysed several types of teams – taskforce or cross-functional team, quality circles, departmental teams, organisational policy-making teams, self-managed teams – and found that most teams have common features but a different network structure. Teams' network structure varied according to different levels of centralisation, hierarchy, reciprocity of ties, network diversity, density of ties, strength of ties and types of ties (e.g. friendship, advice).

Strength of ties is another important network measure used to predict the influence on the performance of teams. Granovetter defined the strength of a tie as a "combination of the amount of time, the emotional intensity, the intimacy (mutual confiding) and the reciprocal services which characterize the tie" (Granovetter 1973, 1361). People with strong ties are in interaction at least twice a week and develop a high level of shared understanding, habits and trust. The effectiveness of an organisation in terms of productivity, innovation and employee satisfaction depends on the strength of the relationships of its people (Anklam 2003). "Networks are as much process as they are structure, being continually shaped and

reshaped by the actions of actors who are in return constrained by the structural positions in which they find themselves" (Nohria and Eccless 1992, 7).

In his study on the strength of strong ties, David Krackhardt (1992, 216) revealed that "social network analysis can predict what kinds of ties matter under what kinds of circumstances in what ways". Strong ties (friendship ties) that cut across departmental boundaries were better suited for adapting to environmental changes and uncertainty. Strong ties represent a basis of trust that can reduce resistance to change and provide comfort in uncertain conditions. Change is not facilitated by weak ties, but by a particular type of strong tie. Krackhardt (1992, 218) defined strong ties or the Greek »philos« (friend) as the ties, that consist of interaction, affection and time. Interaction creates an opportunity for the exchange of information, affection creates the motivation to treat another in a positive way and time creates the experience needed to allow each person to predict how the other will use the shared information. According to Granovetter (1973), strong ties bond similar people together and these people tend to group together so they are mutually connected. The information obtained through such a network is likely to be redundant. Granovetter argues that weak ties, representing a »local bridge« to parts of the social system that are otherwise disconnected, are more important than strong ties. Weak ties provide people with access to information and resources beyond those available, but strong ties have a greater motivation to be of assistance and are more easily available (Krackhardt 1992, 218). Strongly connected individuals develop a high level of shared understanding. Strong connections bond individuals more closely together and create reliable channels for communication (Coleman 1988), and the development of trust and friendship relations among individuals (Homans 1950). Weak ties, on the other hand, increase an individual's opportunities (like career advancement) and enable access to new knowledge (Granovetter 1973). Hansen (1999) showed how weak inter-unit ties help project teams in the search for useful knowledge in other subunits but inhibits the transfer of complex knowledge. This specific knowledge requires a strong tie between two parties for such a transfer. Weak inter-unit ties speed up projects when knowledge is not complex, but slow them down when the knowledge to be transferred is highly complex.

Teams where members are connected with strong ties are defined as cohesive teams. Cohesion refers to the strength of the network of social bonds that unite members of a group or team. The Hawthorne studies showed that the productivity of cohesive groups was higher than of other work groups and, even more importantly, members of cohesive groups were more likely to have respect for their supervisor than others (Blau and Scott 1963). The positive implications of cohesion on the group dynamics and performance of the network have been presented by several authors, specifically in connection with the building of trust in networks (Granovetter 1973; Coleman 1990). Still, when groups become too tightly knit and information passes only among a select few, networks can become competency traps (Smith-Doerr and Powell 2003). Increased interpersonal bonds among team members increase pressure to conform to group norms (Levi 2007). In order to create cohesive teams, members must establish and accept norms that support frequent communication, the development of good relationships and effective coordination among team members. Reagans and Zuckerman (2001) found in their research that network density enhances communication, coordination and team performance, but Sparrowe et al. (2001) did not find support for the density-performance thesis. "One of the most powerful interventions to develop network cohesiveness is to put people together in teams, since working together towards the shared goal is a great way to develop or strengthen relationships" (Anklam 2003, 27).

Some researchers (Ancona 1990; Reagans and Zuckerman 2001) studied the social networks of teams where they focused on another social network perspective that is predicted to influence the performance of teams, namely, the social network ties team members have outside the team. Reagans and Zuckerman (2001) found that network heterogeneity in terms of boundary-spanning ties has an influence on the team's performance. The density of boundary-spanning ties was positively related to team performance and was particularly valuable when the team members were more densely connected within a team. Their findings are consistent with the "structural holes approach", where a team's value is thought to derive from the bridging of "structural holes". Actors who develop ties with disconnected groups gain access to a greater set of ideas and opportunities than those who are limited to single one (Burt, 1992).

In her study, Ancona (1990) also found a positive relationship between the external communication of a team and its performance. Team-context interaction was examined within a governmental organisation with regard to five consulting teams that were externally oriented and had a high level of autonomy. The data revealed three strategies toward the teams' environment: informing, parading and probing. Informing teams remained relatively isolated from their environments, parading teams had high levels of passive observation of their environment, while probing teams actively engaged outsiders. Probing teams revised their knowledge of the environment through external contact, initiated programmes with outsiders, and promoted their team's achievements within their organisation. They were rated as the highest performers among the teams; however, member satisfaction and cohesiveness suffered in the short run. The research results show that opening a group's boundaries may have negative effects on teams' internal processes. Ancona's overall findings suggest that external activities are better predictors of team performance than internal group processes for teams facing external dependence. On the other hand, Haas (in Katz and Lazer 2003) found that external connectedness can be positive or negative, depending on the task overload and team autonomy. For teams with little autonomy or overloaded team members, external communication has a negative impact on the team's performance. These results are in line with the results of a research study by Baldwin et al. (1997) which showed that teams whose members reported a higher number of communications and friends outside of the group were less successful than those who were less expansive. Too much outside contact may detract from a team's focus and its within-team performance.

Findings from Ziherl et al. (2006) show that the number of contacts group members have outside their group (bridging ties) as well as the size of a network influence group performance. In groups that consist of members with numerous contacts outside the group, members bring into the group the skills, experiences and connections they have with outside individuals and groups and this can increase the knowledge transfer in the group (Ziherl et al. 2006) and provide the group with a competitive advantage. The size of a network represents the number of actors directly connected to each other and is "significantly related to diversity in social resources ... because larger networks generate more solution to

a problem simply because an individual can turn to more people for exchanging ideas" (Ziherl et al. 2006, 221).

All of the research mentioned above analysed social networks at the group level, while some researchers also examined the social networks of individual team members according to their demographic characteristics, like gender. But the research on gender and its relationship to group performance is limited (Stashevsky and Koslowsky 2006). The results of a recent study carried out by Berdahl and Anderson (2005) show that women preferred equality norms in groups and a decentralised structure, while men preferred a centralised structure. Stashevsky and Koslowsky (2006) found a positive influence of density on team performance, but no significant effect of leadership style or gender.

In her study of women networks in a US advertising firm, Ibarra (1992) found that women had to develop separate networks for both instrumental and expressive resources. They were unable to access comprehensive ties that bring different resources and, as a result, they had less access to potential instrumental resources like advice, information and political support than men did. Women were in a less advantageous position because their networks were more difficult to maintain. Ibarra (1993) explains the differences in organisational networks of women as specific groups and men as dominant groups in relation to the organisational context in which interaction patterns are embedded that creates constraints on them. Important predictions concerning the limited access of women and minorities to interaction networks in organisations are related to the homophily of social ties or interaction with similar others and women tend to have a smaller set of such "similar others" ties (Ibarra 1993, 67).

Recent research on the social networks of men and women entrepreneurs (Širec and Crnogaj 2009) reveals that women developed different personal and organisational levels of networking than men. Women had slightly more intensive personal networking (membership in professional and business-related organisations, communication with business-to-business partners and people outside the company), while men were more engaged in sports and interest activities. The results also indicate that women assessed the intensity of cooperation with different partners higher than men did and that Slovenian

companies run by women entrepreneurs network more intensively at the intercompany or inter-organisational level than those run by men. But when comparing interaction between entrepreneurs' personal and business networking, the social networks of men overlapped more, while women largely separated their private lives from business. These results are consistent with the findings of Ibarra (1992) that women develop separate networks to access different resources that exist in personal and business networks, while different social networks of men overlap.

2.3 Research review of social networks of team leaders

Leadership is a topic of "perennial interest in organization studies" (Mehra et al. 2006, 64) and there is a persistent belief that leaders can enhance the performance of their groups. Leaders have an important role in organisations because they link groups together and, as members of other groups, represent their groups elsewhere in the organisation (Handy 1976). Previous research on group leaders mostly focused on different leadership styles and personal attributes that were predicted to influence group performance, while less attention has been devoted to social relationships in which leaders are embedded (Mehra et al. 2006). Recently, with the help of the social network analysis approach, the theory on leadership changed its focus from being centred only on leaders to a focus on the social relationships leaders have with team members and other individuals inside and outside their organisations. Balkundi and Kilduff (2006) stress, that leadership today requires the management of social relationships.

Team leaders have numerous tasks in their teams. They are responsible for the high motivation of team members, the attainment of team goals and good interpersonal relations and they also bear the burden of their team's effectiveness (Balkundi et al. 2009). Team leaders can be assigned to a team by the organisation, which is the most common form of team leadership, and have the authority to make the team's decisions or they can be elected or rotated. Leaders who have been elected from among team members have limited power and act as facilitator of the group process (Levi 2007).

The leader can have formal and informal power in the group or team. A formal status and official power gives them access to management and other leaders and these bridging ties enables them to channel the necessary information, supplies and services from other departments to their subordinates. Having a formal position and power does not mean that subordinates will respect the team leader or seek the leader out for work-related or professional advice. Informal leaders, on the other hand, have a prestigious position in a team's social network and are approached by many subordinates for work-related or even personal advice. Informal leaders also have a more comprehensive view of the social structures of their teams and this information can help them make better decisions (Balkundi and Harrison 2006). Merton (1957) points out that the effective and stable formal authority of a leader requires them to become familiar with the prevailing norms.

To obtain informal structural power, leaders need legitimism from other team members. This can be gained through their ability to help team members solve complex problems and their willingness to furnish help and do favours for them. Leaders who give team members more autonomy and self-direction support the social networks of their teams by motivating team members to obtain advice and social support from each other by developing closer social bonds (Blau and Scott 1963). And since relationships are usually not mutually excluding, the presence of even asymmetric relationships between members and leaders provides an opportunity for the exchange of information in both directions (Kilduff and Krackhardt 2008), so team leaders also benefit from contacts with team members.

The already mentioned Hawthorne studies of the 1930s showed that the presence of a leader who removes obstacles to communication – those created by other aspects of group differentiation – improves the group's problem-solving abilities (Blau and Scott, 1963). With the help of the social network perspective, the research approach to leadership became more comprehensive. »By examining the leader's direct and indirect ties with subordinates, it offers us the opportunity to develop a better understanding of a leader's position in the team's overall social structure and its implications for important team processes and outcomes« (Balkundi et al. 2009, 302–303).

In the research on the impact of team leaders' social networks on team performance (Kilduff and Tsai 2003; Balkundi and Kilduff 2006; Balkundi and Harrison 2006; Kratzer et al. 2008; Balkundi et al. 2009), the most often applied network measure is leaders' centrality. A number of network researchers have found that centrality within their units' informal social networks yields substantial benefits for individuals, including influence, access to information, positive performance ratings and pay raises (Brass 1984; Ibarra and Andrews 1993; Baldwin et al. 1997). Occupying a central network position is highly prestigious as one is visible and popular in the network (Wasserman and Faust 1994). Brass (1984) found that centrality in the informal network itself predicts power. Centrally located individuals are in a better position to monitor the flow of information, gain instrumental assistance and social support (Mehra et al. 2006). With the help of formal power, an informal leader increases the sphere of their influence over subordinates (Blau and Scott 1963). Effective leaders rely more on informal power such as expert power than on formal power sources like hierarchy (Balkundi and Harrison 2006). The lack of a leader's informal power within the team restricts their ability to influence subordinates and promote team cohesion (Balkundi et al. 2009).

Social network centrality is one of the most important network measures in social network analysis. The results of the research, carried out by Brass and Burkhardt (1992, 210) showed, "that centrality was positively and significantly related to power in organisation no matter which measure of centrality or unit of reference was chosen". This indicates that the greatest power and influence have individuals who are central within their social networks. This power, prestige and social influence was labelled by Burt (1992) as social capital. Freeman (1979) defined three measures of an individual's centrality, degree centrality, betweenness centrality and closeness centrality, as commonly accepted standard measures of centrality. The in-degree centrality measure identifies the prestige of individuals as the number of connections with others, betweenness centrality defines the potential to control information between other actors in the network, whereas the closeness centrality measure identifies the efficiency of communication exchange by an individual based on how close they are to other people in his/her social network (Wasserman and Faust 1995; Costenbader and Valente 2003).

In social network analysis, prestige is conceptualised as a particular pattern of social relations and people who receive many positive choices are considered to be more prestigious (de Nooy et al. 2005). Prestige in advice networks can help team leaders accomplish their tasks and facilitate team harmony and performance (Balkundi et al. 2009). Leaders who have a prestigious structural position are frequently asked for advice by other team members and are a more popular person in the team to socialise with after work. Betweenness centrality represents the extent to which an individual acts as a potential "go-between" for other pairs of individuals who are not connected in the network (Kilduff and Tsai 2003, 132). Leaders with high betweenness centrality are defined as brokers (Balkundi et al. 2009) or gatekeepers (Kilduff and Krackhardt 2008) and have more control over the information flow. The research carried out by Balkundi et al. (2009) found that leaders with a prestigious position in a team's informal social network have teams with lower levels of conflict and greater team viability, while teams with leaders who act as brokers face a higher level of conflict and low team viability.

Another important centrality measure, connected with the informal power of team leaders, is eigenvector centrality. This type of 'borrowed' centrality represents the extent to which the actor is connected to others who are highly central (Kilduff and Tsai 2003). Eigenvector centrality "allows ego to avoid the perils of popularity (too many ties to maintain) and the potential hazards of the ego-between position (conflicting demands from disconnected actors)" (Balkundi and Kilduff 2006, 433). When a leader has social ties to other prominent actors, he gains accesses to valuable resources with just a few connections and this allows him to save time and energy that would otherwise be spent creating social ties with numerous other members. The research carried out by Mehra et al. (2006) showed that team leaders with friendship connections to other prominent leaders positively influenced the level of the organisation's sales and customer loyalty. Prestige, brokerage and "borrowed" centrality are often related with the idea of power and influence (Freeman et al. 1979/1980; Balkundi et al. 2009).

Cross and Parker (2004) define people in organisations, according to theirs` structural positions, as central connectors, boundary spanners, information brokers and peripheral people. Central connectors are those "who have a disproportionate number of direct

relations in the network and might be either unrecognized resources (unsung hero) or bottlenecks. Second types of people are boundary spanners, who connect a department with other departments in the organisations or with similar networks in other organisations. Information brokers communicate across subgroups of an informal network and peripheral people are those who might either need help getting better connected or need space to operate on the fringes" (Cross and Parker 2004, 71). Organisations would benefit from the network research by identifying and leverage their unsung heroes with the support of the implementation of technology.

Organisations are made up of different networks that can provide power to an individual. To fully understand his/her power, it is important to know in which of the various kinds of organisational networks (advice, workflow, friendship) the individual is central. Brass and Burkhardt (1992) investigated the relationship between the centrality and power of individuals in different social networks in an organisation. Their results indicate that an actor's centrality in the department and domination coalition, especially in the communication and friendship network, most strongly contribute to his or her power. The study also showed that the key players in the advice network were not the key players in the friendship network.

Mehra et al. (2006) stressed that little research on leaders' social network ties and their influence on team performance had examined both leaders' internal and external social ties. Previous research focused either on external network ties that connect groups with other groups (Hansen 1999) or on the internal network ties within groups (Sparrowe et al. 2001). In her study, Mehra et al. (2006, 64) found that "leaders' centrality in external and internal friendship networks was related to both objective measures of group performance and their reputation for leadership".

Formal leaders who hold a central position in a team can also be constrained by the connections they have with other team members. Leaders can become unwilling to punish subordinates or become too similar in attitudes with subordinates, which prevents leaders acting in ways to improve team performance (Balkundi and Harrison 2006). One answer to

the structural constraints of leaders is provided by the concept of Simmelian ties. "Two people are 'Simmelian tied' to one another if they are reciprocally and strongly tied to each other and if they are each reciprocally and strongly tied to at least one third party in common" (Krackhardt 1999, 186). When a leader is reciprocally connected at the same time with more than one another person, he is embedded in a clique[2]. Georg Simmel (1950) developed a theory on the structural embeddedness of three or more person cliques and argued that a three-person clique (triad) is different than a two-person clique (dyad) because triads reduce the power of individuals and contribute to the group's survival. Simmel (1950) also argued that the differences between triads and larger cliques were minimal because an individual in larger groups still experiences the group pressure to conform. The structure of three or more reciprocally connected people constrains the leader to act more independently and make autonomous decisions. According to Krackhardt (1999, 186), "each pair of people in a clique is Simmelian tied to each other; and conversely, any pair of individuals who are Simmelian tied are co-members of at least one clique". Simmelian ties thus represent a constraint because they are embedded in a social context of norms and values that limit the degree to which the two members can create their own norms and values (Kilduff and Tsai 2003). The more cliques leaders are embedded in, the more they need to comply with the norms and values of all those cliques. Kilduff and Krackhardt (2008) argue that different cliques have different interpretations of reality and when leaders act as brokers between different groups, they can experience a cross-pressure from different cliques.

2.4   Social network analysis as a modern approach to HRD

The network perspective is most appropriate for explaining the process of achieving the outcomes of human resource development (HRD). With the help of social network analysis, an organisation or a team is able to open up workplace social interaction for systematic

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[2] A clique is a maximal set of three or more nodes (people) who are directly and reciprocally connected to each other.

empirical study (Pirttilä 2006). In the context of continuous organisational improvement, social network analysis can be used as a one-time intervention or part of an adaptive approach to human resource development (Anklam 2003). Social networks help to explain changes in areas relevant to HRD including organisational performance, the motivation of employees and quality of work life, career development, leadership, decision making etc. (Storberg-Walker and Gubbins 2007).

The network perspective as an alternative perspective changes the research and practice of HRD because change is explained in terms of the social relations between people. Team performance is a typical HRM research topic and interventions to manage or create teams used to be focused on team members' characteristics like personality type or members' expertise (Storberg-Walker and Gubbins 2007). The network perspective explains team performance as a function of relationships not of characteristics. Reagans et al. (2004) found that creating and managing teams as social networks resulted in making better teams. Similarly, Coleman (1988) pointed out that it is not enough to focus on the individual components of performance, but it is also necessary to pay attention to the relationships that impact the ability of individuals to function as a unit. Different research showed (Kilduff and Tsai 2003; Cummings and Cross 2003; Balkundi and Harrison 2006) that connectivity increases the effectiveness among individuals in the organisation so, to improve the connectivity, HRD researchers need to measure the relations between people and study the forces that impact the relations among them.

Social network analysis should also be focused on the development of appropriate network structures (bridging/bonding ties) since the assumption that more connectivity is always better is not true (Storberg-Walker and Gubbins 2007). Different research studies indicate that too many strong connections can have a negative impact on productivity (Cross and Parker 2004), while bonding networks are also time-consuming to maintain and less likely to provide novel information (Hansen 1999). Bridging ties, on the other hand, are less intense but also less useful for transferring complex information (Hansen 1999). By understanding the network structure, HRD researchers are able to identify the opportunities and constraints that exist in organisations (Storberg-Walker and Gubbins 2007). Garcia argues

(2007) that the configuration of the organisation's social relationships can be reorganised to better support an organisation's objectives, just like a formal organisational chart.

Social networks also illuminate individuals who are important network players such as central connectors, bottlenecks, boundary spanners, information brokers and peripheral people (Cross and Parker 2004). Relational data gives an insight into the structural position of individuals within a group context and this can reveal the structural pressures that might exist and inhibit group performance (Hatala 2006). The identification of those individuals can help HRD managers determine the appropriate strategies to improve knowledge sharing, introduce change interventions, increase learning or improve organisational or group performance (Storberg-Walker and Gubbins 2007). HRD managers can leverage these key actors in the network – those whom people go to for expertise, ideas and problem solving, or those who play brokering role across critical groups – to help with the promotion and implementation of the envisaged organisational changes (Paris 2007).

By revealing the patterns of connectivity, social network analysis (SNA) provides a useful tool for implementing strategies to improve performance, learning and knowledge sharing (Storberg-Walker and Gubbins 2007). SNA helps HRD managers identify why specific organisational problems like a lack of learning transfer occur and who are the central employees (Hatala 2006). Various SNA measures (density, centralisation) can serve in an assessment to determine the right approach to intervention.

HRD scholars should thus be aware of the diverse tools that explore processes which help organisations become more effective (Hatala 2006). By targeting strategic points in an organisation's social network, managers can ensure information is disseminated quicker and collaboration occurs among the individuals when and where it is needed. After looking at 62 organisations, Cross and Parker (2004) say that well-managed networks are crucial to performance and innovation. "Social network analysis allows one to conduct very powerful assessments of information sharing within a network with relatively little effort, thereby revealing both points where collaboration is effective and points where improvement is necessary" (Cross et al. 2003, 4). SNA also allows the identification of the strategic persons in

the organisation who`s relationships are critical for obtaining information and solving problems and who has influence over others (Cross et al. 2003).

The field of HRD is a relatively new discipline and continues to explore new theories and methodologies and social network analysis can play an important role in moving HRD forward (Hatala 2006). Identifying and developing connections between individuals and teams with mutually valuable social resources can ensure organisations reap greater returns from their human resources (Storberg-Walker and Gubbins 2007).

2.5 Hypotheses

Based on the results of the previous research on the social networks of teams and team leaders, we propose seven hypotheses. We proceed from the assumption that different patterns of teams' and team leaders' social networks impact the performance of teams differently and thus follow two social network approaches, the structuralist network approach and the individualist (connectionist) network approach (Borgatti and Foster 2003). By applying the structural network approach, we examine the overall network structure of social ties within and outside the team and, by applying the individualist network approach, we examine team leaders' informal social ties with other team members and their structural position in the teams' network.

Density, centralisation, network diversity and team performance

In their studies on the influence of social networks on team performance, various researchers (Ancona 1990; Baldwin 1997; Hansen 1999; Brown and Miller 2000; Reagans and Zuckerman 2001; Sparrowe et al. 2001; Cummings and Cross 2003; Oh et al. 2004; Henttonen et al. 2010) have focused on different network measures (centralisation, strength of ties, density, bridging ties). The results show that diverse network measures influence the performance of teams, although researchers have most often focused on network measures inside the team such as density and/or centralisation since it is assumed that the overall structure of connections that are present or absent influences the network dynamics. Yet the findings of some other network research reveal that bridging ties outside the team

(Ancona 1990; Reagans and Zuckerman 2001; Ziherl et al. 2006) and the size of a network (Ziherl et al. 2006) are as important as the social networks inside teams for the performance of those teams. In the dissertation, we therefore focus on three network measures that are assumed to influence the success of teams: density or cohesion; centralisation; and team network diversity.

When the structure of network ties within a group shows certain desirable topological features such as a high overall density (Mehra et al. 2006), the opportunity to exchange information and support increases and group performance can be enhanced (Oh et al. 2004). Previous network studies (Baldwin et al. 1997; Reagans and Zuckerman 2001; Kratzer et al. 2005; Henttonen et al. 2010) found a positive linear relationship between density and group performance, while Sparrowe et al. (2001) did not find any support. Oh et al. (2004) found that the relation between social-network density, defined as closure, and performance was not linear, but an inverted U-shape: group effectiveness was maximised when there was a moderate number of relationships within the team. This might be connected with the complexity of ties since previous research (Reagans and Zuckerman 2001; Baldwin et al. 1997; Sparrowe et al. 2001) focused on a single resource tie, while Oh et al. (2004) studied more comprehensive ties that are both instrumental and socialising and require a greater investment of time and attention. Connected networks are thought to be more cohesive (de Nooy et al. 2005) and cohesive structures work better because they provide individuals in the network with greater access to information and resources (Coleman 1988). "When team members share advice with many other members, the team should benefit in terms of increased cooperation and information sharing, and the broadening of expertise" (Henttonen et al. 2010, 390). In this dissertation we analyse both types of ties – single resource advice ties and more comprehensive socialising informal ties – and hypothesise:

H1a. A higher level of cohesion in a team's advice network is positively related to the team's performance.

H1b. A higher level of cohesion in a team's socialising network is positively related to the team's performance.

Another network measure that has been shown to influence the performance of teams is the level of centralisation. Teams are, by definition, collectivises of equal experts and that implies a flattened linear structure. In a centralised network communication is constrained, information and the decision-making process are restricted and distributed according to linear structures (Kovačič and Lužar, 2011), while a decentralised network provides a more or less equally distributed communication process where all network members participate in the decision-making process. Although Sparrowe et al. (2001) found only marginal support for a negatively hypothesised relationship between advice network centralisation and group performance, other research results show that a lower level of centralisation is more beneficial for the performance of teams, especially when dealing with more complex tasks (Shaw 1964; Cummings and Cross 2003). We therefore hypothesise:

H2a. A lower centralisation degree in a team's advice network is positively related to the team's performance.

H2b. A lower centralisation degree in a team's socialising network is positively related to the team's performance.

Teams that connect a large number of people with different sets of contacts, skills, information and experiences in the one place enjoy an enhanced capacity for creative problem solving (Reagans and Zuckerman 2001) since larger networks provide more opportunities for the exchange of advice, solutions and different ideas. But, at the same time, opinions and behaviours are more heterogeneous between teams than within teams so it is important that team members also have contacts with people with different knowledge and positions outside their team (Ziherl et al. 2006). Different researchers have found a positive relationship between teams' bridging ties and team performance (Ancona 1990; Reagans and Zuckerman 2001; Ziherl et al. 2006) and we therefore describe the network diversity of teams in terms of the team network size and the number of bridging ties team members have with other teams and other team leaders and propose:

H3. The network diversity of a team has a positive impact on the team's performance.

The team leader's centrality and team performance

From the individualist perspective, specific sets of the individual's ties can benefit group performance to the extent to which members are connected with individuals who can convey the requisite resources. Social networks of individuals (leaders) are predicted to influence the performance of teams (Oh et al. 2004) and we thus also examined the structural position of leaders in teams' social networks.

Team leaders hold a prestigious formal position in a team so they are expected to also have influence and social power in informal social networks. Formal team leaders can benefit from being informal leaders as well. Central individuals in an informal social structure (those subordinates seek for advice or friendship) have access to diverse data and resources. Balkundi and Harrison (2006) defined central leaders as prestigious leaders. Central leaders can use their informal power, which is partly provided to them by their network position, to guide teams toward common team goals and positively affect performance (Balkundi and Harrison 2006). Different research results have shown that teams with leaders who are prestigious in the team's intragroup networks tend to perform better (Mehra et al. 2006; Balkundi and Harrison 2006; Balkundi et al. 2009), therefore we propose:

H4a. Teams with leaders who hold a prestigious position in the advice network are more successful.

H4b. Teams with leaders who hold a central position in the socialising network are more successful.

3   RESEARCH METHODOLOGY

In the theoretical part of this doctoral dissertation, we present teams from a social network perspective and, based on the previous research on the influence of social networks of teams and team leaders on team performance, we propose seven hypotheses. In this chapter we describe the setting of the empirical research. We outline the application of different methods for data collection and data analysis, highlight the unique measurement approach to social network analysis and describe in detail the sample, procedure and survey data collection process in the Finnish and Slovenian teams. We also refer to the missing data problem and present the operationalisation of the measures we included in the data analysis.

Organisational information on teamwork in Finnish and Slovenian organisations

Slovenia and Finland differ considerably at both the national and organisational levels.
At the organisational level, Slovenia and Finland may be distinguished in the development of their HRM practices. A comparative analysis of human resource management in Slovenia and other European countries (Ignjatović and Svetlik 2004) classified Finland and Slovenia in two different HRM groups. Finland was classified in the Nordic group, characterised by employees' strong involvement in HRM and flexibility policy that enables decentralised decision-making. Other analyses (Kanjuo-Mrčela and Ignjatović 2006) also defined Finland as a country with well-developed worker-centred and company-centred flexible work practices (teamwork, multi-tasking, participation and decentralisation of decision-making, time autonomy in the workplace). Slovenia, on the other hand, was located in the group of Central and South European states characterised by low-intensity HRM with the high centralisation of decision making (Ignjatović and Svetlik 2004).

In line with the employee-focused HRM of average intensity (Ignjatović and Svetlik 2004), teamwork is a well-established work practice in Finland, in the past also supported by the Finnish government. In Slovenia, teamwork became a more established form of work organisation when the political system changed in the 1990s (Lužar 2011). Results of the European Working Conditions Survey from 2010 (European Foundation 2010) show that

Slovenia and Finland both have a high share of employees who work in teams, 65 percent in Finland and 67 percent in Slovenia, compared to the European average (57.5 percent). Finland also has higher level of self-managed teams (41 percent), where team members decide on the distribution of work tasks and the choice of team leader, compared to Slovenia (33 percent). But, in recent times, results of the Quality of Work Life Survey (Lehto and Sutela 2009) have shown that the prerequisites for good teamwork have shrunk during the past five years. Fewer people are satisfied with the team-based method of working or the way in which they can participate in the group's decision-making process. Fewer people also believe that teamwork increases work productivity or promotes the equal distribution of work tasks. One of the reasons for the greater dissatisfaction with teamwork can be found in the research on work and health carried out by the Finnish Institute of Occupational Health where employees reported that teamwork lacks a strategic orientation, there is not enough discussion about work tasks, objectives and the meeting of these objectives (Lehto and Sutela 2009). It seems that the concept of teamwork has reached its limits in Finland.

Team discussions regarding work tasks, objectives and meeting these objectives are only successful when team members develop good communication. The basis for good communication is developed social relations that depend on understanding and trust (Levi 2007). The structure of relations within a team reveals the possibilities of actors to communicate with a certain number of other actors in a network (Kovačič and Lužar 2011). Despite comparative research (Ignjatović and Svetlik 2004, Kanjuo-Mrčela and Ignjatović 2006, EWCO 2010) that characterises Finland as a country with a well-developed HRM and teamwork approach, it seems that Finnish employees still lack good communication and good social relations. In this doctoral thesis we sought to estimate if the current trend is also present in the Finnish teams included in the research.

3.1 Combined methodological approach and social network analysis

The basic unit of our research is organisational teams and to collect and analyse teams' social networks as complete networks we employed several methodological approaches. We collected data on the advice and socialising ties of team members using a sociometric survey

(Stork and Richards 1992), which is the most common method for collecting social network data, where individuals are asked to describe their relationships with others. Researchers use sociometry as a quantitative representation of interpersonal relationships for a description of group structures (Moreno, 1960). We combined quantitative methods with qualitative ones. According to Warwick (1973), the appropriate methodological approach depends on the research goals and the knowledge of respondents and researcher about the subject of the research. The subject of our analysis is a complex set of social connections and interactions so it was necessary to combine different approaches to understand the results within the wider context. Social network data for the team members was in some cases collected as a web survey and in some cases personally in the field. We combined the sociometric survey with qualitative methods such as personal interviews with HR managers from Finnish and Slovenian companies[3] and organisations. This was done to obtain organisational information on the organisational context of the teams and the nature of their work.

Cummings and Cross (2003) stressed that, despite the potential of combining the research on work groups (teams) and social networks, there have been few field studies over the past several decades. One reason is offered by Hansen (1999), who noted that researchers might find field research too challenging because the researcher, in developing an insight into the relationship between group structure and performance, needs to also pay attention to the characteristics of the work itself. Following Cummings and Cross (2003), we defined the Slovenian and Finnish teams, according to the nature of their work, as work teams and project teams.

Organisations often refuse to be the subject of research for several reasons, largely because of unclear research goals and the purpose of the study. When they are allowed to enter the organisation, researchers interrupt the daily routine and this can influence the results. For research to be successful, it is therefore very important to use the appropriate research methods, properly structured concepts and measurement instruments (Kovačič 2008). It is also important to design a research process in a way that minimally interrupts the business

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[3] The terms company and organisation are used interchangeably.

and organisational routine. We therefore e-mailed to companies and organisations a short research plan in which we explained the basic concepts and purpose of the research, the team selection criteria and the structure of the questionnaire for team members. We also stressed the benefits that SNA brings to companies and organisations.

Social network analysis "employs a unique measurement approach, which is quite distinctive from other perspectives, by utilising structural or relational information to study or test theories" (Hatala 2006, 49). Social networks are measured according to four elements of a research model: (a) the choice of research units (individuals, groups, organisations, communities, states); (b) the type of connections; (c) the form of connections; and (d) the level of data analysis (Wasserman and Faust 1994). Network data can be collected in two ways, as an ego network and as a complete network. "Ego network analysis includes the relationships that exist from the viewpoint of a particular individual" (Hatala, 2006, 52), while a complete network analysis includes connections among a set of respondents based on a common criterion.

The first step in conducting social network analysis involves three basic units analysis – dyadic (tie-level), monadic (actor-level) and network (group-level). The dyadic level represents links between pairs of actors, the monadic one involves cases of actors where variables count as the number of ties a node (actor) has or the sum of distances to others, while the network unit of analysis involves cases of whole groups of actors and the relationships among them (Hatala 2006, 52). Network relations can be measured in a binary way, with 0 indicating a lack of connections and 1 indicating when an individual is connected to all others, or valued measuring the strength of the ties and using a Likert scale from 1 to 5. Connections among actors can be directed or non-directed. Directional ties give information about the direction of the link and some other information, while non-directional connections merely give information as to whether the link exists or not. The key challenge in social network analysis is to explain the existence of the different structures of connections and to consider, at the actors' level, differences that exist in relation with other actors (Kovačič, 2008).

We analysed the collected network data on teams using qualitative methods such as a group comparison approach and statistical methods such as social network analysis and statistical analysis. Social network analysis as a complete network analysis approach (Hatala 2006) was performed on the network data using different network analysis packages such as PAJEK (Batagelj and Mrvar 2004). We treated teams as complete networks with directed and valued ties and performed two levels of network analysis, more structural, a network (group-level) analysis in the case of teams and a dyadic (tie-level) analysis in the case of team leaders. We further analysed the network data with programs for statistics and tested the proposed hypotheses by applying three different data analysis approaches; correlations, group and leader comparison approach and multivariate (regression) analysis. We used Pearson's correlation to measure the association between variables for the quantitative data measures. The general criterion for accepting the hypotheses was a statistically significant difference at the 10-percent level (two-tailed test) because of the small sample size. We used factor analysis for data reduction.

3.2   Sample and Procedure – Finnish teams

In July 2009, we contacted 32 Finnish companies from the Helsinki Top 100 Finnish stock market list, as advised by co-mentor Prof. Taatila, who has in the past worked for several team-based companies. Finnish companies listed on the Helsinki stock market are successful companies with a long tradition of teamwork. We sent an invitation to participate in the research with a cover letter describing the purpose of the study and ensuring the confidentiality of group members by e-mail to 32 human resource managers of private companies and two CEOs of public research organisations (the professor's personal acquaintances). Five managers, including two research organisations, replied positively. In a consultation with a colleague at the Helsinki University of Technology (Prof. Sweins), we were informed that Finnish researchers have problems obtaining data from Finnish companies as they are often not prepared to participate in scientific research due to their busy workdays. This turned out to be true since some HR managers responded to our invitation by stating they found the idea of our research very interesting but were currently in the middle of intensive business challenges and so they were unable to participate.

In September 2011, we carried out semi-structured interviews with CEOs and HR managers of all five Finnish companies, two large and one average-sized private companies and two large public organisations, to obtain organisational information about the nature of teamwork and characteristics of Finnish teams. The HR managers of one Finnish company and two organisations also provided us with a list of the teams and names of team members who had been chosen to participate in the research. Two other managers from average-sized and large private Finnish companies promised to choose the right teams for the research and send us the teams' contact details by e-mail but this did not happen, even after a few missed phone calls and e-mail follow-up reminders.

The final sample consisted of three out of the five Finnish organisations, one a private media company with nine teams and two public research organisations with two and three teams, respectively. Out of those three organizations, we included in the social network analysis only two Finnish organisations with eight teams (Appendix A) , representing a 57 percent response rate from the teams and an 80.7 percent response rate from the team members. The main condition for teams to be included in the research was team tenure. Team members should have been together for at least six months or more.

The Finnish teams had on average eight members per team. All teams had a designated leader, appointed by the CEO or executive manager, and members generally came to the team from the same department. Work teams were involved in more routine daily work with weekly meetings ranging from sales, manufacturing (printing), service (product delivery) and HR development, while project teams worked on research and educational projects developing, among others, innovative teaching approaches. The Finnish companies and organisations included in the research use both work and project teams as an established way of organising work.

Survey Data Collection

Data on the teams' social networks were collected through a sociometric instrument (questionnaire) in September, October and November 2009 in 14 teams from three Finnish organisations. We created matrices with the names of team members, individually for every

team, and asked HR managers to send the questionnaire to the team members as an e-mail attachment. The questionnaire was in the English language.

In the large media company, the HR manager sent the questionnaires to members of all nine teams and asked them to return the answers to my e-mail address. After the first positive feedback from one-third of the team members at the beginning of October 2009, we sent two more follow-up reminders to those who did not reply in the next two weeks. In this company, 50 team members from five teams out of 83 team members from nine teams responded to the questionnaire representing a 60 percent response rate from team members and a 75.4 percent response rate from the five teams. The four other media teams only reached a 35.8 percent average response rate so we did not include them in the analysis.

In the public research organisation, data on the teams' social network data were collected personally and all three teams reached a very high response rate, 89.7 percent on average. After having a meeting with the CEO of the organisation and the leaders of all three teams, the leaders asked their team members to cooperate in the research and fill in the questionnaire that was given to them at a short meeting on the agreed day. This was done for each team separately. Members who did not come to the meeting received the questionnaire by e-mail and we asked them to return their answers to us by e-mail. The final response rate from the team members was also very high, with 17 members out of 19 responding to the questionnaire, representing a response rate of 89.5 percent.

In the other research organisation, we also held a meeting with the leader of the two teams to get organisational information on the teams' characteristics. Because it was not possible to personally collect social network data from the team members due to their busy schedules, we asked the team leader to promote our research to members of both teams. We sent the team members the questionnaire by e-mail and asked them to return the answers to us by e-mail. In this organisation, the project teams were large, with 20 and 24 team members, less cohesive and very autonomous and because the leader was, compared to the other HR managers, the least supportive of our research the team members had a very low response rate, less than 40 percent, so we did not include these two teams in the analysis.

3.3 Sample and Procedure – Slovenian teams

In June 2011, we conducted a preliminary empirical survey on teamwork to find Slovenian companies that had successfully implemented a teamwork approach. We asked the Slovenian Human Resource Association (SKZ) to publish on their website an invitation for HR managers to participate in our online research on teamwork. There was no response. So we further sent the invitation to the HR managers of Slovenian organisations (76) that had received the basic certificate "Family Friendly Enterprise"[4]. One of the requirements of the certificate is teamwork as a modern approach to work. In the online survey, 31 out of the 76 Slovenian organisations contacted participated, coming from the manufacturing, service and public sector, and representing a 41 percent response rate. The survey results show that a high share of the Slovenian organisations included in the research have formally organised permanent teams (74 percent) or occasional teams (26 percent) with 3 to 15 members (Lužar and Kovačič, to be published).

In September 2011, we contacted those HR managers (14) who had participated in the research on teamwork and were interested in the teamwork survey's results. We invited them to participate in the research on the social networks of teams as a continuation of the research on Slovenian teams. Two companies responded positively. We had an interview with the HR managers of both companies, explaining to them the advantages for the teams to be part of the research, and one company with one team decided to participate.

At the end of September 2011, we e-mailed an invitation for the research to 20 Slovenian companies, recommended by SKZ, and to 13 Slovenian organisations based on personal contacts[5]. We received a positive response from four companies and organisations, while the others were sent a follow-up reminder at the beginning of October. We then tried to reach all HR managers by phone and 14 HR managers (nine from the personal networks) agreed to have a meeting with us. At the end of October, we e-mailed them a research plan

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[4] The certificate has been awarded to Slovenian companies since 2007.

[5] Recommendations from other companies, personal contacts of Prof. Kanjuo-Mrčela, the mentor of this dissertation

with more details about the social network survey and a sample of the questionnaire for the team members.

We held meetings with HR managers and team leaders from 11 Slovenian organisations in October, November and December 2011, to establish organisational information on the nature of teamwork and the characteristics of teams. Three other HR managers promised to select teams and send us their names by e-mail. After a few reminders (by phone and e-mail), the HR managers of those three Slovenian organisations decided to withdraw from the research. Due to turbulent business periods, another 11 Slovenian organisations also delayed defining their teams till March and April 2012, despite our persistent reminders. The patience was worthwhile since three companies with seven teams decided to participate in the research. We realised that a research setting and the selection of the right teams for the research on the side of companies was becoming a longitudinal process so at the end of January 2012 we contacted the HR managers of six more Slovenian organisations that have a reputation of successful teamwork and received positive feedback from one company where we included five teams in the research.

Following Cummings and Cross (2003) and Huang and Cummings (2011), we were aware of the need to obtain the support of executive management or upper level management for the research to be successful and to achieve a high response rate from the team members. At the beginning of December 2011 we had a meeting in one private research and development company with HR managers and department managers to evaluate the benefits the research would bring to their organisations and their teams if they were to decide to participate. At this meeting we promoted numerous advantages that social network analyses bring to HRM practice and the development of teams as described in detail by Hatala (2006). The meeting was successful and the executive managers decided to support our research. The HR manager contacted the team leaders for data on the team members and in February and March 2012 we collected social network data for 11 teams.

At the end of January 2012, we had to repeat a meeting in one private company which had already decided to participate in November 2011, but a new person had by then become the head of the HR department. Fortunately, we already had support from the previous HR

manager who had been promoted to executive manager. The meeting was successful and in May 2012, after a few e-mail follow-up reminders, we included three teams in the research.

The final sample in May 2012 consisted of 13 out of the 53 contacted Slovenian organisations with 38 teams, representing a 24.5 percent response rate from the organisations. In the social network analysis we included 26 teams from 8 organisations (Appendix A), representing a 68.4 percent response rate from the teams and an 89 percent response rate from the team members. The main condition for teams to be included in the research was team tenure. Team members should have been together for at least 6 months or more.

The Slovenian teams had on average nine members per team. All the teams had a designated leader appointed by the CEO or executive manager, and the members generally came to the team from the same department. The teams in our research defined as work teams had a high level of self-management and were involved in routine daily work with weekly meetings ranging from sales, services (insurance, finances and accounting) and HR management. The project teams, on the other hand, drew their members from different disciplines and functional units like marketing, engineering and manufacturing and worked on research and development projects, either producing a new product or service or improving existing concepts. Although project teams are usually time-limited and produce one-time outputs, the project teams in our research had a long team tenure. This indicates that the Slovenian companies and organisations included in the research use project teams as an established way of organising work.

Survey Data Collection

We collected social network data in 38 teams from 13 Slovenian organisations from November 2011 till May 2012. We created an online questionnaire, in the Slovenian language, with the names of team members individually for every team (team matrixes). We then asked the HR managers to e-mail the team members online links and each team had its own link to the questionnaire. The first page in the online survey replaced the cover letter

and included an introduction describing the purpose of the study and ensuring confidentiality for group members, as advised by Cummings and Cross (2003).

The process of data collection was challenging and time-consuming. We had two phases of data collection, from November till December 2011 and from February till May 2012. In November and December 2011, we started to collect social network data in five teams from the two public research organisations and in two teams from the two private companies. The HR managers in the public organisations were very supportive of the scientific research and team members cooperated with a high response rate. After the first positive feedback, over a period of two weeks we sent team members two follow-up reminders. Four of the seven teams had a high enough response rate of 81 percent, on average[6].

From February till May 2012 we continued with the network data collection in the other company teams. We created online questionnaires for 15 company teams and seven teams had a high enough response rate (93 percent on average), while eight teams had a too low response rate (34 percent on average) to include them in the final analysis. In one large research and development company we collected the data personally. In February 2012, we held meetings with five company teams, each team individually. We briefly described the purpose of the research, explained the content of the questionnaire and the benefits members would gain as a team from the social network analysis. We asked them to take 15 minutes to answer the questionnaire and each team had half an hour to complete the survey. Team members had previously been asked to bring a personal computer to the meeting so they could answer the online survey. For those few who did not have a computer we prepared a printed version of the questionnaire. We later manually entered their answers in the database. The response rate of the team members was very high, 92 percent on average. We sent those who did not come to the meeting a follow-up reminder with an online link to the survey. In March 2012, the same company sent us a list of six more teams,

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[6] We followed Gabbay and Zuckerman (2008) and Ziherl et al. (2006) in that teams needed to reach at least a 60 percent response rate to be included in the research.

along with the e-mail addresses of the team members, and asked us to include them in the research. We e-mailed the team members an online link to the questionnaire for their team and two follow-up reminders over the next two weeks. Five teams out of six had a very high response rate (92 percent on average), while one team only had a 57 percent response rate. From this company, we included ten teams with an average response rate of 92 percent in the analysis. We believe the high response rate of the team members was due to two reasons; we had full support from the management and at the meetings we tried to make the team members partners in the research. We personally collected data in another, average-sized company. We brought a printed version of the questionnaire for each of the five teams and the team members completed the survey in their break time. The response rate was 84 percent due work absences.

The lowest response rate was achieved by one large research and development company in the field of computer programming with five project teams. With this company we had no meetings with the HR manager or team leaders. The company's teams were large in size[7] and very autonomous. The HR manager had a challenging task to convince the team members to participate in the research because they were concerned about the content of the questions and the confidentiality of the data collection. We offered to hold a meeting on the company's premises with the HR manager and team leaders to explain the purpose of the survey but, due to the nature of their project work, that was not possible. Despite two follow-up reminders sent by the HR manager to the team members, the average response rate was just 35 percent. We believe that one reason for the low response rate in this company was the lack of a personal approach. Social network questions are typically 'sensitive' and individuals might be afraid that their position within the network will be exposed (Hatala 2006, 64).

3.4   Sociometric instrument – survey questionnaire

The survey questionnaire had three parts: demographics; questions on intragroup and intergroup social networks; and the team's self-evaluation (Appendices F and G).

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[7] Ranging from 12 to 36 team members

In the first part of the questionnaire, we asked the respondents about their demographic characteristics such as age and gender and organisational characteristics like occupation/profession, education, previous occupational, organisational and team tenure.

In the second part, we asked the respondents about their social network ties, advice and socialising ties they have inside and outside the team. We also asked them about the type of resources that flow through their internal and external socialising ties; more specifically, whether they socialise with other team members (including leaders) for social support (associating outside the workplace, friendship relationship), trust, political support (support in promotion, career development, consultation in the decision-making process, and support in conflict situations), information (about work, other team members and organisation), emotional support (confidential issues, support in crisis situations) or some other reasons.

In the third part, we asked the respondents to evaluate the self-management level of their team and the team's effectiveness in terms of its productivity, cooperation and empowerment. We also asked the respondents about their satisfaction in the present team.

3.5   Missing data problem

One of the greatest limitations of the social network analysis approach is ensuring the complete response rates which are required to conduct a complete network analysis (Hatala 2006, 64). Historically, network researchers analysed data sets "with response rates between 90 percent and 65 percent" (Stork and Richards 1992, 195), so it is unrealistic to expect a 100 percent return rate from any survey (Robins et al. 2004). Missing key individuals in a social network analysis can impact the overall understanding of the social networks being studied (Cross and Parker 2004; Borgatti et al. 2006; Costenbader and Valente 2003), so it is very important to gather all information available about the repondents` relationships with other parties involved in order to analyse theirs` social networks correctly (Stork and Richards 1992).

It is easy to collect sociometric data, but it is more difficult to analyse it, particularly when data that describe network relationships are missing (Stork and Richards 1992). »Missing data are … a curse to survey network data (because) network analysis is especially sensitive

to missing data« (Burt 1987, 63). Missing data cause a serious problem for network analysis at the system level because they create missing links in the »who to whom data matrix« which distorts the social network structure (Stork and Richards 1992). One of the main causes of missingness is non-response. There are two types of non-response, unit non-response where actors are completely missing, and item non-response where data on particular items (ties, attributes) are missing (Huisman, 2009). In our research, the main problem of missing information was unit-non response when team members did not respond to the survey. With those who did respond, item non-response was present in less than 5 percent of the completed surveys.

There are several ways for researchers to treat missing values, which are often found in data from empirical research. The easiest option would be to ignore the missing data and only analyse existing responses, but this can result in a loss of information and a decrease in statistical power, which could lead to serious bias in the results (Huisman 2009; Little and Rubin 1989/1990). »There is no failsafe solution to the missing data problem« (Knoke and Kuklinski 1982, 35), but results of a stimulation study performed by Huisman (2009) show that simply ignoring the missing data can have a large negative effect on the structural properties of the network. Huisman (2009) also stressed that simple imputations can only successfully correct for non-response in a few specific situations. Little and Rubin (1989/1990) proposed three different ways matrices with missing data can be analysed, as complete-case analysis, available-case analysis and imputation. The simplest approach, often used in statistical analysis programs, is to only use complete cases and discard all incomplete cases. "The second approach includes both complete and incomplete cases, and uses whatever data are available for a given analysis... With imputation, missing values are replaced by estimated values so that complete data matrix can be analysed" (Stork and Richards 1992, 196-197).

In the research, we treated missing data by using two simple imputation methods, imputation by reconstruction (Huisman 2009) and imputation by reconstruction for directed networks with valued ties (Gabbay and Zuckerman 1998). The reconstruction procedure is the simplest imputation method for undirected networks like a socialising network where

the direction of ties is not important (who socialises with whom after work), as it is assumed that reported ties match across actors (Huisman 2009). Stork and Richards (1992) suggest that we can reconstruct the missing part of undirected network using the observed incoming relations of the missing actors. We replaced all missing ties in the research with the observed value of the opposite tie in the dyad. In cases where the dyad was completely missing, and since the reconstruction does not allow the adding of links to the data set where there are none, we followed Huisman (2009) and used a random imputation proportional to the observed density (the probability of a tie is equal to the observed network density).

In directed networks, where the direction of ties is important ("who goes to whom for advice"), a large number of ties may not be reciprocated, so we followed Gabbay and Zuckerman (1998) who suggest the application of imputation by reconstruction for directed networks with valued ties. In the teams' advice networks, where the direction and strength of ties are important, we imputed the ties reported by the observed respondents about their relationship with the non-respondent. According to Gabbay and Zuckerman (1998), the validity of this imputation is supported by the fact that among the dyads with full information, 45 percent of the reported interactions matched exactly and 74 percent differed by no more than one level. We could use this procedure only in the network analysis of the Slovenian teams, where we included in the sociometric questionnaire an additional matrix with the team members' names, and a reverse question on contact data. Along with the common SN question, »How frequently did you go to this person for task-related advice«, team members were also asked »How frequently did this person come to you for task-related advice". Team members' answers to this question gave us information on the interaction frequency of other members with the respondent. Following Gabbay and Zuckerman (1998), we used the imputation by reconstruction approach only for teams where at least two-thirds of the team members had responded to the network questions. In cases where dyads where completely missing, we used the mean interaction frequency of the team.

3.6 Measures

In this sub-chapter, we present the operationalisation of demographic/organisational and social network measures of the Slovenian and Finnish teams and team leaders. We included in the analyses all important measures of the teams (density, centralisation, tie strength, multiplex ties, network diversity, demographic and organisational characteristics, size, resources and team typology) and of the team leaders (centrality, tie strength, Simmelian ties, bridging ties and multiplex ties). The demographic and organisational characteristics and network measures of teams are defined as independent variables and the team performance as a dependent variable.

Social network measures

The network survey listed the names of each individual in the respondent's team. The respondents were asked to report on advice-related "How frequently did you go to this person for a task-related advice problem in the last three months" and socialising-related interaction with other team members "How frequently did you go out with this person for social activities outside work such as going out to an informal lunch, dinner or drinks in the last three months". The network measures used in the data analyses were built on measures of network density, strength of ties, network centralisation, network centrality, network diversity, multiplex ties, Simmelian ties and the demographic/organisational characteristics of team members.

Network Density

Density is one of the key elements of the structural approach to social network analysis and refers to the number of links between vertices (de Nooy et al. 2005). Following Scott (2000) and Sparrowe et al. (2001), we measured network density as the number of actual contacts over all possible contacts.

When all team members have ties to each other, the density is maximal (1) and when the team members are not connected the density is minimal (0). But since the relations in our data were valued, we operationalised density with valued ties as a measure of the teams'

cohesiveness and density as a measure of the network connectedness. The value of relations was measured on a Likert scale ranging from 0 meaning "never" to 4 meaning "daily".

Density with valued ties was measured as a sum of the valued tie strengths in the group divided by the total possible sum of tie strengths among all members of the group (Scott 2000). By examining the frequency of relations at the network level, we tried to reveal the opportunities the actors had to communicate.

Strength of ties

Strength of ties was measured as the average frequency of contacts among all team members in the advice and socialising networks. These network data were valued on a five-point Likert scale ranging from 0 meaning "never" to 4 meaning "daily". We obtained data on the tie strength from the dyadic relations between the team members and we then averaged the values on the team level. We defined weak ties as ties with a value from 0.5 to 2, meaning that team members consult (ask for advice) and socialise less than once a month or 1–3 times a month and strong ties as ties with a value from 2 to 4, meaning that members consult and socialise 1–3 times a week or daily. In the work setting, frequent communication is very important for members to feel trusted enough to share important information (Levi 2007) and to encourage all members of a group or team to participate in the work process. We also measured the strength of leaders' ties as the average frequency of contact between leaders and other members in both networks. We defined weak ties as ties with a value from 0.5 to 2, meaning that team members consult (ask for advice) and socialise less than once a month or 1–3 times a month and strong ties as ties with value from 2 to 4, meaning that members consult and socialise 1–3 times a week or daily.

We left data on the teams' and leaders' socialising ties in asymmetric form, following Oh et al. 2004, to preserve the information on the strength of the ties.

Network centralisation

When the subject of network analyses is an entire network (state, organisation, group/team) we measure network centralisation, and when the subject of analyses is an individual we measure his/her centrality.

To calculate the centralisation of each team's structure, we used degree centralisation based on the degrees of points which are indexes of communication activity (Freeman, 1979). The centralisation of a team can vary between 0 (all team members are equally important) and 1 (one team member is the most important). A network is highly centralised if there is a clear boundary between the centre and the periphery (de Nooy et al. 2005). Network centralisation provides an insight into the equality of the tie distribution and the participation of the team members (Freeman, 1979). Network centralisation increases when the number of highly central people in the team decreases.

Different measures of centralisation can be applied to different networks. Since data were left in asymmetric form, we calculated the in-degree centralisation in the advice network as the proportion of team members who give advice to the other team members (de Nooy et al. 2005). In the socialising network, we calculated the all-degree centralisation as a proportion of members who have the highest in-degree and out-degree centrality. Betweenness centralisation was calculated as the proportion of team members who act as an intermediary in the network (de Nooy et al. 2005) and eigenvector centralisation as the proportion of team members who have connections with other prominent members (Balkundi and Kilduff 2006).

Teams have high in-degree centralisation when the majority of team members seek advice from one or a few central members, high betweenness centralisation when one or a few central members act as brokers between other team members and high eigenvector centralisation when there are one or a few central team members who are connected to other highly central members. Teams have high all-degree centralisation when one or a few team members are the most popular to socialise with, high betweenness centralisation when one or a few members socialise with other members who do not socialise among themselves, and high eigenvector centralisation when one or a few central members socialise with other central members.

Leader centrality

We used the measure of centrality degree to describe the position the formal leader holds in the team network. We measured the leader's in-degree centrality in the team advice

network to operationalise the leader's prestige and the leader's all-degree centrality in the team socialising network to operationalise the leader's central position. In-degree centrality is one of the most common measures of centrality and was calculated by counting the number of direct links to a leader (Wasserman and Faust 1994). All-degree centrality was calculated as the sum of in-degree and out-degree centrality. Degree centrality can vary between 0 (no connections to a specific person) and 1 (all members are connected to that person). If a team leader is often sought for advice by many other team members and if many other team members socialise with the team leader, the leader is highly prestigious.

To measure one person's structural power, other measures of centrality can also be applied. In the team advice network, we measured the leader's out-degree centrality, while in both networks we measured the leaders' betweenness centrality and eigenvector centrality. The leader's out-degree centrality was calculated by counting the number of direct links from a leader (Wasserman and Faust 1994) and presents the number of people chosen by the actor. The betweenness centrality of a leader, also defined as brokerage, was measured as the extent to which the leader falls between other pairs of actors on the shortest paths connecting them (Freeman 1979). A leader's eigenvector centrality, also defined as 'borrowed' centrality, represents the extent to which the formal leader has connections to other central actors in a network (Costenbader 2003), which gives him/her access to valuable resources.

Network diversity

We measured the network diversity of the teams as the number of members in each team[8] and the number of bridging ties the team members have with the members of other teams ("others") and other team leaders inside their organisation. We also measured the network diversity of the team leaders as the number of bridging ties the leaders have with other teams and other team leaders. To identify bridging ties, each respondent was asked to name up to ten people inside his/her organisation, but outside of his/her team to "whom he or she often turned to for work-related advice" and "with whom he or she had been out with often for social activities outside of work such as going out to informal lunch or dinners".

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[8] Team members are members of the team network.

Multiplex ties

In the research we were interested to see whether the team members' and team leaders' advice ties extend to become more complex ties, multiplex ties, which offer team members more (socialising, trust, social support, political support etc.) than just work-related information.

We measured the multiplex ties of the teams as the proportion of advice and socialising ties the team members have in the same relation with other members and the multiplex ties of the team leaders as the proportion of advice and socialising ties the leaders have in the same relation with all other team members. We collected data on the advice and socialising ties separately, through two network questions, and then combined the data into a single measure or index. The network matrix on multiplex ties gives information on four possibilities; no tie exists, only an advice tie exists, only a socialising tie exists, and both ties exist. We only considered the last option, when both ties are present. If the ties the team members and team leaders have with other members are at the same time advice ties and socialising ties, then the value is 1 (maximal).

The leaders' Simmelian ties

Simmelian ties capture the structure of network ties in which leaders are embedded. We measured the number of the leader's Simmelian ties as the number of dyadic ties between a leader and other team members who both belong to the same clique (Kilduff and Tsai 2003).

Demographic and organisational characteristics of the team members

To obtain data on the team members we asked them about their demographic and organisational characteristics. Demographic data include age and gender, while organisational characteristics include education, organisational tenure, team tenure and diverse professional backgrounds.

When asking about age, the team members could choose from among four categories; under 25 years, between 25–40 years, between 40–55 years and more than 55 years. We computed the data in two categories; the first category (1) consists of members aged below

25 years and between 25–40 years[9], while the second category (2) consists of members aged between 40–55 years and more than 55 years[10]. In the case of the team leaders we preserved all four age categories. Men were defined as group 1 and women as group 2. Regarding level of education, the team members were asked whether they had finished elementary school, vocational school, high school, or hold a university degree, a master's degree or a PhD. We computed the data in three categories; the first category (1) includes elementary, vocational and high school, the second category (2) is equal to a university degree and the third category (3) includes a master's degree and PhD. In the case of the team leaders we preserved all six categories.

We calculated organisational and team tenure as the average number of years of organisational and team membership. To identify the team members' professional background, we asked them about their previous occupational organisational and from which organisation/company did they had come to the present team. The professional background of the team members and team leaders was defined as 1 if they came from other organisations and 0 if they had always worked for the present organisation.

Resources

We asked the team members about the nature of their socialising relations inside and outside their teams. Respondents could select one or several options of tie resources (social support, trust, political support, information, emotional support or some other reasons) and rank them according to their importance, from the most important (6) to the least important (1). We included in the analysis only resources that received the highest importance. With the data on the resources that flow through the team members' socialising ties we also obtained information about the resources the team leaders provide to their team members.

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[9] Less than 5 percent of the team members in the Slovenian and Finnish teams were younger than 25 years.

[10] Less than 7 percent of the team members in the Slovenian teams and 10 percent of the team members in the Finnish teams were older than 55 years.

Size

Size represents an important control variable because the teams in our research vary considerably regarding the number of team members, from 4 to 22 members. Team performance depends on the volume of work produced by the team members (Henttonen et al. 2010, 397) and it has been often argued that performance decreases with an increasing team size (Kratzer et al. 2005). Team size was measured as the number of members in a team.

Team typology

The organisational teams in the research were, according to the nature of their work, defined as work or project teams. Work teams are involved in the production of goods or provision of services and the main work tasks of project teams are related to research and/or new product or service development. We categorised work teams as "1" and project teams as "2". The team typology in our analysis (Appendices B and B1) strongly correlates with the teams' effectiveness and social network characteristics.

Team tenure

It has often been argued that team performance decreases with age (Guzzo and Dickson 1996; Kratzer et al. 2005). Some authors (Henttonen et al. (2010) have in their research on social networks of teams controlled for team tenure and found that social networks and demographic/organisational measures were still significant predictors of team performance even after controlling for team tenure. Following Henttonen et al. (2010), we defined team tenure as the average number of team members' years in the team.

Team performance as a dependent variable

The team members and team leaders assessed the team effectiveness and self-management levels of their teams on a five-point Likert scale ranging from 1 meaning "strongly disagree" to 5 meaning "strongly agree".

In order to evaluate the **level of self-management** in the Slovenian and Finnish teams and to see whether teams with greater autonomy perform better, we asked the team members and team leaders about the extent to which they agreed or disagreed that their team is "eager to

take on the responsibilities traditionally reserved for management", "fully accepts making more and more decisions such as planning and scheduling work" and "fully supports taking on the responsibility for production/services related concerns" (Kirkman and Saphiro, 2001).

The performance of teams is defined as team effectiveness. Team members and leaders assessed **team effectiveness** measured by three team qualities; team productivity, team cooperation and team empowerment (Kirkman and Shapiro, 2001). To assess **team productivity**, the team members were asked to use a six-item scale to describe the extent to which their team "meets or exceeds team goals", "completes team tasks on time", "makes sure that products and services meet or exceed production/services standards", "responds quickly when problems come up", "is a productive team" and "successfully overcomes problems that slow down work". To assess **team cooperation**, the team members were asked to use a three-item scale to describe the extent to which members of their team are "willing to share information with team members about the work", "cooperate to get the work done" and "team enhances the communication among people working on the same product/services". To evaluate **team empowerment**, the team members were asked to use a three-item scale to describe the extent to which their team "has confidence in itself", "can select different ways to do the team's work" and "believes that the team's work is valuable and makes a difference to the organisation".

We conducted factor analysis to comprise team productivity, cooperation and empowerment into one factor, team effectiveness, as recommended by Kirkman and Shapiro (2001). The results of the factor analysis of the Slovenian teams showed that all of the 12 items loaded onto one factor, explaining 55 percent of the variance. We also measured the reliability of the members' and leaders' answers for team effectiveness, α = 0.909. The factor loading for team effectiveness in the Finnish teams was even higher, explaining 72 percent of the variance. The reliability of the members' and leaders' answers for team effectiveness in the Finnish teams was α = 0.775. The evaluation of team effectiveness was derived from an assessment made by the leaders and members, which makes it a "quasi self-report" measure (Henttonen 2010, 396). Self-report measures are often criticised since they reflect perceptions of individual members on how well the team worked together (Huang and Cummings 2011) and that some people cannot report their

performance accurately (Kratzer et al. 2008). But since the team members and leaders evaluated their teams rather than their own performance, the effects in the data should be smaller than when the focus is on individual performance (Henttonen et al. 2010). According to Ancona and Caldwell (1992), member ratings and executive ratings are legitimate indicators of team performance. Other researchers confirm this assumption and Heneman (1974) thought that self-report measures are less restricted in range and leniency than »more objective« supervisory ratings. Cooper (1981 as cited in Henttonen 2010) in his study of the success factors in engineering-design teams showed that team members and leaders achieved accuracy levels of over 80 percent when they assessed their projects after completion. Following Kratzer et al. (2005), we tested the quality of these self-reports since the team leader data was available for 24 Slovenian and 7 Finnish teams. For these teams, we compared the leaders' ratings with those of the team members. A paired-samples t-test of the difference between the two samples (team members vs. team leaders) showed no statistically significant differences between the two ratings (t= 1.17, p= 0.254 in the Slovenian teams; t= 0.351, p= 0.738 in the Finnish teams). We included the ratings from the team members and team leaders in the evaluation of team effectiveness.

Members of the Slovenian and Finnish teams, including the team leaders, evaluated the effectiveness of their teams very highly. In the Slovenian teams, the least effective team on a scale from 1 (least effective) to 5 (most effective) was evaluated with a score of 3.42 and the most effective team with a score of 4.57. The mean value for team effectiveness was 4.15 (SD= 0.278). Since the variance in the team performance was low (0.251), we decided to group the Slovenian teams according to the average value of team effectiveness in two equal groups (analysis 1, Table 3.1). The first group represents teams that are below-average effective (less effective teams) and the second group represents teams that are above-average effective (more effective teams). When we compared the demographic, organisational and social network characteristics of the less and more effective teams, the data showed no major difference between these two groups of teams. We therefore decided to further group the Slovenian teams according to the average value of team effectiveness in three equal groups (analysis 2) to increase the contrast in the dependent variable (team performance). In analysis 2 (Table 3.2), the first group represents teams that are below-average effective (the least effective teams), the second group represents teams

that are average effective (medium effective teams) and the third group teams that are above-average effective (the most effective teams).

Table 3.1: Effectiveness of the Slovenian teams – analysis 1

	Frequency	Valid Percent	
3.42	1	3.8	
3.71	1	3.8	
3.77	1	3.8	
3.85	1	3.8	
3.92	1	3.8	1st group
3.93	1	3.8	(less effective teams)
3.94	1	3.8	
4.04	2	7.7	
4.06	1	3.8	
4.13	1	3.8	
4.14	1	3.8	
4.18	1	3.8	
4.21	1	3.8	
4.24	1	3.8	
4.25	2	7.7	
4.28	1	3.8	2nd group
4.31	1	3.8	(more effective teams)
4.35	1	3.8	
4.37	1	3.8	
4.40	1	3.8	
4.48	1	3.8	
4.52	1	3.8	
4.54	1	3.8	
4.57	1	3.8	
Total	26	100.0	

Table 3.2: Effectiveness of the Slovenian teams – analysis 2

	Frequency	Valid Percent	
3.42	1	3.8	
3.71	1	3.8	
3.77	1	3.8	
3.85	1	3.8	1st group
3.92	1	3.8	(least effective teams)
3.93	1	3.8	
3.94	1	3.8	
4.04	2	7.7	
4.06	1	3.8	
4.13	1	3.8	
4.14	1	3.8	2nd group
4.18	1	3.8	(medium effective teams)
4.21	1	3.8	
4.24	1	3.8	
4.25	2	7.7	
4.28	1	3.8	
4.31	1	3.8	
4.35	1	3.8	
4.37	1	3.8	
4.40	1	3.8	3rd group
4.48	1	3.8	(most effective teams)
4.52	1	3.8	
4.54	1	3.8	
4.57	1	3.8	
Total	26	100.0	

In the Finnish teams, the least effective team on a scale from 1 (least effective) to 5 (most effective) was evaluated with a score of 3.69 and the most effective team with a score of 4.71. The mean value for team effectiveness was 4.00 (SD= 0.323). Similar to the Slovenian teams, the variance in team performance was low (0.253) so we decided to group the Finnish teams according to the average value of team effectiveness in two equal groups (analysis, Table 3.3). The first group represents teams that are below-average effective (less

effective teams) and the second group represents teams that are above-average effective (more effective teams).

Table 3.3: Effectiveness of the Finnish teams – analysis

	Frequency	Valid Percent	
3.69	1	12.5	
3.78	1	12.5	1st group
3.81	1	12.5	(less effective teams)
3.87	1	12.5	
3.96	1	12.5	
4.05	1	12.5	2nd group
4.17	1	12.5	(more effective teams)
4.71	1	12.5	
Total	8	100.0	

Team performance is in bivariate and multivariate analysis defined as an ordinal variable and the outcome of team success was coded as "0" and "1". In the analysis (Finnish teams) and analysis 1 (Slovenian teams), less effective teams (1st group) were categorised as "0" and more effective teams (2nd group) as "1". In analysis 2 (Slovenian teams), the least effective teams (1st group) were categorised as "0" and the most effective teams (3rd group) as "1". We did not include in the analysis the second group of medium effective teams to obtain a stronger contrast in the dependent variable (team performance).

4   SLOVENIA

4.1   Team effectiveness and advice network

The research aim of this study is to examine the impact of different patterns of teams' social network structures on team performance by controlling for the demographic and organisational characteristics of teams.

In this chapter we present a research model (Figure 4.1) for measuring the impact of teams' demographic/organisational characteristics and advice networks as independent variables on team effectiveness as a dependent variable. To test the model, we apply three different data analysis approaches; correlations, a group comparison approach and regression analysis. At the bivariate level, we examine correlations among different groups of measures (demographic/organisational measures, social network measures and team performance) and compare the characteristics of teams according to their performance (group comparison approach). With multivariate (regression) analysis, we test the proposed hypothesis H1a, H2a and H3 (Chapter 2.5) on the impact of advice networks on team performance by controlling for demographic/organisational measures.

Figure 4.1: Research model for data analysis in the advice network of the Slovenian teams
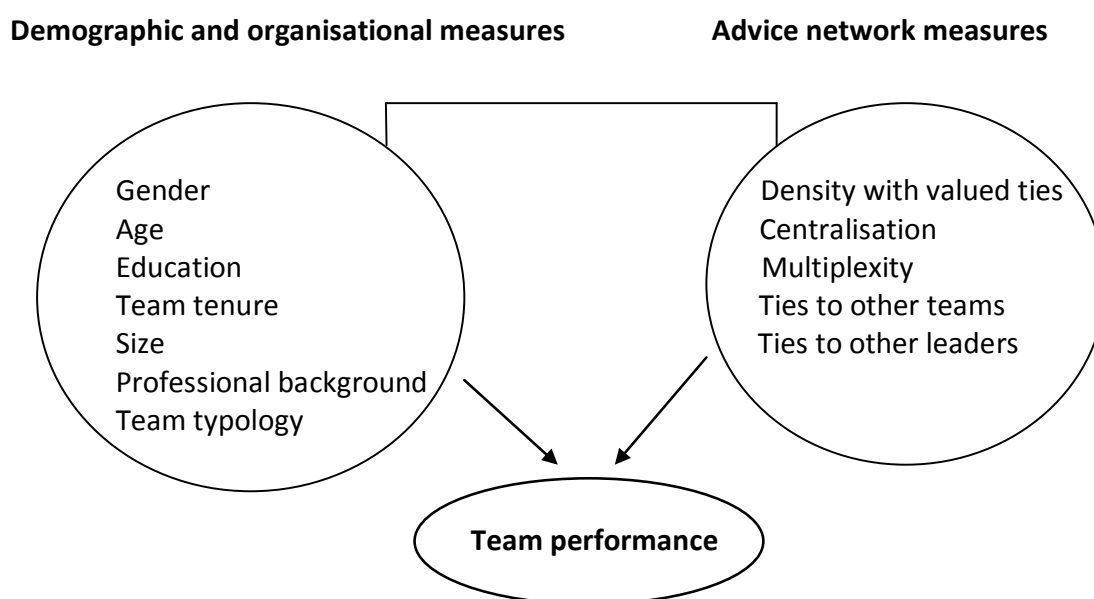
Demographic and organisational measures

Gender
Age
Education
Team tenure
Size
Professional background
Team typology

Advice network measures

Density with valued ties
Centralisation
Multiplexity
Ties to other teams
Ties to other leaders

Team performance

Basic characteristics of Slovenian teams

In the research on social networks of teams we included 26 teams with 195 team members from 8 Slovenian organisations, with 3 of the teams coming from the public sector and 23 teams coming from the private sector. The majority of teams (21 teams or 81%) come from large organisations with 250 to 500 employees, while 5 teams come from average sized private company with little more than 100 employees. The Slovenian teams have a high level of team effectiveness (the average score is 4.15 out of 5) and a high level of self-management (the average score is 4.08 out of 5). Satisfaction with working in the present team among members of the Slovenian teams is very high (92 percent).

The majority (74.4 percent) of the Slovenian team members from the research are men; 67 percent of team members are 40–55 years old, 26 percent are between 25–40 years and younger, while 7 percent are older than 55 years. A university degree is held by 68 percent of team members, 14 percent finished secondary education and 18 percent hold a master's degree or PhD (Table 4.1).

Table 4.1: Demographic characteristics of the Slovenian teams

		Frequency	Valid Percent
Gender	Men	145	75.9
	Women	46	24.1
	Total	191	100.0
Age			
	under 25 years, 25-40 years	87	26.0
	40-55 years and more	107	74.0
	Total	194	100.0
Education			
	Elementary, vocational and high school	28	14.5
	University degree	131	67.9
	Master's degree and PhD	34	17.6
	Total	193	100.0

The Slovenian team members had been working for their organisations for an average of 12.6 years and had been members of their teams for an average of 6 years. The teams have on average nine members and one-third of the team members have a diverse professional background (Table 4.2).

Table 4.2: Organisational characteristics of the Slovenian teams

	N	Minimum	Maximum	Mean	Std. Deviation
Organisational tenure	26	.2	37.0	12.605	8.4902
Team tenure	26	.2	32.0	6.023	5.5512
Size	26	4	22	9.19	4.167
Professional background	26	0	7	3.19	1.877

The figures in Tables 4.1 and 4.2 on the demographic and organisational characteristics of Slovenian teams show that the typical Slovenian team in the research consists of team members who are mostly men, highly educated, in a mature working age (40–55 years) and with a long organisational and team tenure. The Slovenian teams are on average small in size and have few members with a diverse professional background.

We classified the teams according to the nature of their work as work teams and project teams (Cohen and Bailey 1997). Among the 26 Slovenian teams in the research, 12 teams with 64 team members were defined as work teams (46 percent) and 14 teams with 131 team members as project teams (54 percent). When looking at the demographic characteristics of the work and project teams (Table 4.3), women in work teams account for 36 percent and men for 64 percent of members; 61 percent of the team members are aged 40–55 years and above, 39 percent of members are between 25–40 years and younger. The majority of members (76 percent) have a university degree, while 22 percent of the team members have a secondary education. In the project teams, women represent 18 percent and men 82 percent of the members; 52 percent are aged 40–55 years and above, 48 percent are between 25–40 years and younger. Sixty-four percent of members have a

university degree, 26 percent of members a master's degree or PhD and 10 percent have a secondary education.

Table 4.3: Demographic characteristics of the Slovenian work and project teams

| | | Team typology | | |
		Work teams	Project teams	Total
Gender	Men	41 (64.0%)	108 (82.4%)	149 (76.4%)
	Women	23 (35.9%)	23 (17.6%)	46 (23.6%)
	Total	64 (100.0%)	131 (100.0%)	195 (100.0%)
Age	under 25 and 25-40 years	25 (39.1%)	62 (47.7%)	87(44.8%)
	40-55 years and more	39 (60.9%)	68 (52.3%)	107 (55.2%)
	Total	64 (100.0%)	130 (100.0%)	194 (100.0%)
Education	Elementary, vocational and high school	14 (21.8%)	14 (10.8%)	28 (14.5%)
	University degree	49 (76.6%)	82 (63.6%)	131 (67.8%)
	Master's degree and PhD	1 (1.6%)	33 (25.6%)	34 (17.7%)
	Total	64 (100.0%)	129 (100.0%)	193 (100.0%)

The data in Table 4.3 on the demographic characteristics of the Slovenian work and project teams reveal there are more women in work teams than in project teams and more men in project teams than in work teams; more members of work teams are in their mature working age, while members of the project teams have a higher education than members of the work teams.

Descriptive characteristics of the advice networks of the Slovenian teams

In their advice network, the Slovenian teams have (Table 4.4) high density (0.85, SD= .146), moderate cohesiveness (0.54, SD= .183), a low centralisation degree (the highest score, 0.22, SD= .093, has eigenvector centralisation) and moderate multiplexity (0.39, SD= .214). The average strength of the ties among the team members is 2.47 (SD= .516), which means that

members consult 1–3 times a week. Teams have more advice ties to other teams (50 advice ties on average) than to other team leaders (13 advice ties on average).

Table 4.4: Advice network characteristics of the Slovenian teams

	N	Minimum	Maximum	Mean	Std. Deviation
Density	26	.48	1.00	.8537	.14683
Density with valued ties	26	.21	.94	.5371	.18367
Strength of ties	26	1.6	3.8	2.467	.5166
Centralisation (in-degree)	26	.00	.40	.1295	.10610
Centralisation (betweenness)	26	.000	.297	.04206	.067921
Eigenvector centralisation	26	.00	.39	.2189	.09377
Multiplexity	26	0	1.000	.39558	.213872
Ties to other teams	26	12	113	49.62	26.143
Ties to other leaders	26	0	32	13.46	8.444

More than half the members of the Slovenian teams are strongly connected to each other with advice ties (moderate cohesion) and less than half of the team members socialise after work (multiplexity). The teams have a decentralised network structure and are more connected to other teams than to other team leaders.

4.1.1 Bivariate analysis 1 – correlations

With correlations (Appendix B) we examined which demographic/organisational and advice network characteristics are significantly related to team effectiveness (analysis 1 and analysis 2), defined as an ordinal variable (Chapter 3.6).

Table 4.5: Descriptive statistics and correlations in the advice networks of the Slovenian teams

Variable	Min	Max	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11	12
1.Gender	1	2	1.24	.426												
2.Age	0	1	.55	.499	.060											
3.Education	0	2	1.03	.567	.057	.-146*										
4.Team tenure	.2	32	6.02	5.55	.288**	.128	.001									
5.Size	4	22	9.19	4.167	-.191**	-.007	.197**	.031								
6.Professional background	0	7	3.19	1.877	-.106	-.011	.318**	.038	.310**							
7. Team typology	1	2	1.67	.471	- 203**	-.076	.291**	.012	.595**	.495**						
8. Density with valued ties	.21	.94	.49	.170	.080	.089	-.207**	-.112	-.701**	-.332**	-361**					
9. Centralization (indegree)	.00	.40	.15	.104	-.011	-.099	.233**	.072	.633*	.297**	.394**	-.861**				
10.Multiplexity	0	1.0	.38	.173	.000	-.040	.123	-.036	-.169*	.251**	.126	-.090	.232**			
11.Ties to other teams	12	113	60.18	30.12	-.320**	.079	.046	-.093	.831**	.246**	.475**	-.556**	.356**	-.272**		
12.Ties to other leaders	0	32	13.18	8.34	.033	.050	.053	.105	-.261**	-.006	.120	.175*	-.297**	-.139	-.080	
13.Team effectiveness (analysis 1)	0	1	.50	.501	.040 .	.031	-.056	.063	-.223**	-.166*	-.215**	.217**	-.232**	-.102	-.109	.045
14.Team effectiveness (analysis 2)	0	1	.50	.501	.164	.062	-.173*	.130	-.265**	-.198*	-.235**	.296**	-.291**	-.126	-.150	.076

Correlation is significant at the 0.05 level, ** Correlation is significant at the 0.01 level

Table 4.5 shows the descriptive statistics and correlations of demographic/organisational measures (gender, age, education, team tenure, size, professional background and team typology) and advice network measures (density with valued ties, centralisation, multiplexity, ties to other teams and ties to other leaders) and effectiveness of the Slovenian teams we included in the bivariate and multivariate analyses.

Relationship between demographic/organisational characteristics and team performance

In this chapter we are interested in how the demographic and organisational characteristics correlate with team performance (Table 4.5).

All of the demographic and organisational variables that significantly correlate with team performance; education (R= -0.173, p= .049 in analysis 2), size (R= -0.223, p= .002 in analysis 1 and R= -0.265, p= .002 in analysis 2), professional background (R= -0.166, p= .021 in analysis 1 and R= -0.198, p= .023 in analysis 2) and team typology (R= -0.215, p= .003 in analysis 1 and R= -0.235, p= .007 in analysis 2), have a negative influence on the teams' success. Successful teams are small in size, defined as work teams, team members have a lower educational level and fewer members come from other organisations (diverse professional background).

Gender, age and team tenure have no significant impact on team performance, but correlate among each other and, since they represent important demographic and organisational characteristics of the teams, we included them in a multivariate regression analysis. Gender is significantly and positively related to team tenure (R= 0.228, p= .002) and negatively to size (R= -0.191, p= .008) and team typology (R= -0.203, p= .005). The age of team members is significantly and negatively correlated to education (R= -0.146, p= .043) and positively to organisational tenure (R= 0.477, p= .000). The women had been present in their teams for a longer time than the men and work in smaller teams, defined as work teams. Older team members are less educated than younger team members and had worked for their organisations for a longer time. Team tenure only positively correlates with organisational tenure (R= 0.449, p= .000), meaning that team members who had been part of their organisations for a longer time had also been members of their teams for a longer time.

Relationship between advice network characteristics and team performance

In this chapter we are interested in how advice network characteristics correlate with team performance (Table 4.5). Density with valued ties is significantly and positively related to the strength of ties (R= 0.891, p= .000) and to density (R= 0.851, p= .000) and, since they all measure the same thing[11] and have a positive impact on team effectiveness (R= 0.217, p= .002 in analysis 1; R= 0.296, p= .001 in analysis 2), we only included density with valued ties in the multivariate analysis. Density with valued ties (cohesion) is significantly and negatively related to different centralisation measures, in-degree centralisation (R= -0.861, p= .000), betweenness centralisation (R= -0.617, p= .000) and eigenvector centralisation (R= -0.610, p= .000). In cohesive teams, members more often turn to each other for advice and teams' social network structures are more democratic and less centralised[12], so more cohesive teams are higher performers.

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[11] Cronbach Alpha of density, density with valued ties and strength of ties is 0.768 (Appendix B.8).

[12] A decentralised structure of a team means that all members of the team are equally important.

Different centralisation measures (in-degree centralisation, betweenness centralisation and eigenvector centralisation) positively correlate among each other and they all measure the same thing[13], but only in-degree centralisation has an impact on team effectiveness in both analyses, so we included a measure of in-degree centralisation in the multivariate analyses of teams' advice networks. More centralised teams are less effective (R= -0.232, p= .001 in analysis 1 and R= -0.291, p= .001 in analysis 2).

Multiplexity, ties to other teams and ties to other leaders have no significant impact on team performance, but correlate between each other and because they present important advice network characteristics of teams we included them in the multivariate regression analysis. Multiplexity significantly and negatively correlates with ties to other teams (R= -0.272, p= .000) and positively with in-degree centralisation (R= 0.232, p= .001). In teams where team members ask for advice, those members they socialise with have few ties to other teams and a centralised network structure.

Teams' bridging ties to other teams negatively correlate with density with valued ties (R= -0.556, p= .000) and multiplexity (R= -0.272, p= .000) and positively with centralisation (R= 0.356, p= .000), which means that the more strongly team members are connected to each other and the more complex their relationships are, the less they communicate with other teams. Teams have more ties to other teams when they have a more centralised network structure.

Teams' ties to other leaders on the other hand positively correlate with density (R= 0.175, p= .015) and negatively with centralisation (R= -0.297, p= .000), which means that teams with ties to other leaders are more cohesive and have a less centralised network structure.

Relationship between the advice network and demographic/organisational characteristics

In this chapter we are interested in how advice network characteristics correlate with the demographic and organisational characteristics of teams (Table 4.4).

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[13] The Cronbach Alpha of in-degree centralisation, betweenness centralisation and eigenvector centralisation is 0.803 (Appendix B.8).

Density with valued ties significantly and negatively correlates with education (R= -0.207, p= .004), size (R= -0.701, p= .000), professional background (R= -0.332, p= .000) and team typology (R= -0.361, p= .000). Cohesive teams have less educated members, are small in size, have fewer members that bring the diversity of their previous professional experiences into the team and are defined as work teams.

In-degree centralisation significantly and positively correlates with education (R= 0.233, p= .001), size (R= 0.633, p= .000), professional background (R= 0.297, p= .000) and team typology (R= 0.394, p= .000). In teams with a centralised communication structure, team members have a high level of education and diverse professional backgrounds, teams are large in size and categorised as project teams.

Multiplexity significantly and negatively correlates with size (R= -0.169, p= .018) and ties to other teams (R= -0.272, p= .000) and positively with professional background (R= 0.251, p= .000). Teams where team members have multiplex ties (advice and socialising ties) are small in size and have fewer advice ties to other teams, but more team members have a diverse professional background.

Ties to other teams significantly and positively correlate with size (R= 0.831, p= .000), professional background (R= 0.246, p= .001) and team typology (R= 0.475, p= .000). Teams with more bridging ties to other teams are large in size, team members have a diverse professional background and teams are defined as project teams. Ties to other leaders significantly and negatively correlate with size (R= -0.261, p= .000). Teams with more bridging ties to other team leaders are small in size.

The results of the correlations show that demographic and organisational characteristics such as education, size, professional background and team typology significantly and negatively correlate with team performance, while gender, age and team tenure have no significant impact on the success of teams. Regarding the advice network characteristics of teams, density with valued ties significantly positively and centralisation significantly negatively correlate with team performance. Multiplexity, ties to other teams and ties to other leaders have no significant impact on the success of teams. Advice networks also correlate with demographic and organisational characteristics, especially density with valued

ties, centralisation and ties to other teams which correlate with size, professional background and team typology. Regarding team typology, we categorised the Slovenian teams as work and project teams (Chapter 3.6) and the results of the correlations show that the Slovenian project teams are large in size, more centralised and less cohesive and have more bridging ties to other teams.

4.1.2 Bivariate analysis 2 – a group comparison approach

In this chapter we continue at the bivariate level of analysis, but team performance is defined differently as groups of teams according to team performance. As described in Chapter 3.6, we categorised teams in two groups (less and more effective teams) and in three groups (least, medium and most effective teams). By applying a group comparison approach, we compared the demographic/organisational and advice network characteristics of the more and less effective teams (analysis 1) and of the most and least effective teams (analysis 2) in order to gain a deeper insight into the characteristics of successful teams. We define more and most effective teams as high performing teams and less and least effective teams as low performing teams.

Basic characteristics of the high and low performing Slovenian teams

The demographic characteristics of the high and low performing teams are similar, the majority of team members are men aged between 40–55 years and holding a university degree. The organisational characteristics of the high and low performing teams involve greater differences.

More effective teams are smaller (9 members vs. 10 members per team on average), team members have a longer average team tenure (6 years vs. 5 years) and fewer members have a diverse professional background (3 vs. 4) compared to less effective teams. More effective teams are defined as work teams and have a higher level of team autonomy (4 vs. 4.15)[14] than less effective teams, categorised as project teams (Appendix B.2).

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[14] higher level of self-management

The most effective teams are similarly smaller than the least effective teams (8 members vs. 11 members), the teams do not differ much regarding team tenure (5.3 years vs. 5.4 years) and fewer members have a diverse professional background (3 vs. 4) than in the least effective teams. The most effective teams are categorised as work teams and have a higher level of team autonomy (4.14), while the least effective teams are defined as project teams and have a lower level of team autonomy (3.93; Appendix B.3).

Descriptive characteristics of the advice networks of the high and low performing Slovenian teams

More effective teams (Appendix B.4) have a higher density (0.88 vs. 083) in the advice network, are more cohesive (0.55 vs. 0.52), team members more often ask for advice from each other[15] (weekly vs. monthly), teams have a lower centralisation degree (in-degree centralisation 0.11 vs. 0.15; betweenness centralisation 0.034 vs. 0.051; eigenvector centralisation 0.21 vs. 0.23) and the teams' multiplexity is lower (0.353 vs. 0.430) compared to less effective teams. More effective teams have more advice ties to other teams (50 vs. 49) and more advice ties to other leaders (15 vs. 12).

The advice networks of the least and most effective teams (Appendix B.5) entail bigger differences. The most effective teams have a higher density than the least effective teams (0.94 vs. 0.79), the teams are more cohesive (0.61 vs. 0.46) and the team members connected with stronger ties (2.6 vs. 2.3). Members of the most effective teams ask for advice from each other 1–3 times a week, while members of the least effective teams do so 1–3 times a month. The most effective teams have a lower centralisation degree (in-degree centralisation 0.08 vs. 0.19; betweenness 0.015 vs. 0.067; eigenvector centralisation 0.18 vs. 0.24) and lower multiplexity (0.285 vs. 0.462), which means that not many team members (29 percent) ask for advice from those members they socialise with after work. Teams have on average fewer ties to other teams (48 advice ties vs. 50 advice ties) and more ties to other leaders (16 advice ties vs. 11 advice ties).

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[15] Tie strength in more effective teams is 2.5 (communication 1-3 times a week) and in less effective teams it is 2.4 (communication 1-3 times a month).

The results of the group comparison approach show that the high performing Slovenian teams (more and most effective teams) are more cohesive, have a decentralised advice network structure, a lower share of multiplex ties (advice and socialising ties), team members who are connected with strong advice ties and have more bridging advice ties to other leaders compared to the low performing Slovenian teams (less and least effective teams). The only difference in the advice network of the more and most effective Slovenian teams is that more effective teams have more bridging advice ties to other teams than less effective teams, while the most effective teams have less bridging advice ties to other teams compared to the least effective teams.

4.1.3 Multivariate (binary logistic regression) analysis – analysis 1

Using a multivariate analysis we tested the research model on the impact of the teams' demographic/organisational and advice network characteristics on team performance (analysis 1) and tested the proposed hypotheses H1a, H2a and H3. Team performance is defined as an ordinal variable (0, 1), so we applied a binary logistic regression analysis. We first tested the impact of the demographic and organisational characteristics on team performance, then we tested the impact of the advice network characteristics and finally we examined the impact of advice network characteristics on team performance by controlling for the demographic and organisational characteristics of the teams.

The demographic and organisational characteristics we included in the analysis are gender, age, education, team tenure, size, professional background and team typology. Education is the only variable with three categories (elementary, vocational and high school, university degree and master's and doctoral degree) so in the logistic regression analysis we defined the ranking for the education variable; a university degree represents parameter (1) and a master's and doctoral degree represents parameter (2) (Table 4.6).

Table 4.6: Education parameter coding

		Frequency	Parameter coding (1)	Parameter coding (2)
Education	Elementary, vocational and high school	27	,000	,000
	University degree	126	1,000	,000
	Master's and doctoral degree	32	,000	1,000

Results of the logistic regression analysis on the influence of the demographic and organisational characteristics show that size is the only variable with a significant and negative impact on team performance (B= -0.106, p= .001). This indicates that team performance decreases with team size. The value of coefficient (B) shows that for a one-unit (team member) increase in team size the log odds of a higher team performance decreases by 0.106. The value of the odds ratio Exp(B) is similar to B, but a more straightforward concept and shows that each new team member that is added to a present team leads to about a 10 percent reduction in the odds of a higher team performance. The model (R-square value) explains 7.8 percent of the variance in the dependent variable (team performance) (Table 4.7).

Table 4.7: Demographic and organisational characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.106	.033	.001***	.899	.078
	Constant	1.194	.390	.002	3.300	

*p<.1, **p<.05, ***p<.01

N = 185 units

Table 4.7 shows size as the only demographic/organisational characteristic of the teams with a significant influence on team performance and it`s statistical characteristics such as coefficients (B or log-odds), their standard errors (S.E.), p-values (Sig.) and the exponentiated

coefficient as an odds ratio Exp(B). Nagelkerke R Square as a pseudo R-square presents the proportion of the explained variance in the dependent variable.

Table 4.8: Demographic and organisational characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 1	Variables	Gender	.011	.917
		Age	.361	.548
		Education	.868	.648
		Education (1)	.827	.363
		Education (2)	.230	.632
		Team tenure	.750	.386
		Professional background	1.611	.204
		Team typology	.698	.403
	Overall Statistics		4.227	.753

Table 4.8 shows those demographic and organisational characteristics of the teams, their scores and p-values that had no significant impact on team performance and were therefore excluded from the equation.

To test the impact of the advice network characteristics of the Slovenian teams on team performance (analysis 1), in the analysis we included density with valued ties, centralisation (in-degree), multiplexity, ties to other teams and ties to other team leaders. The results of the logistic regression analysis show that centralisation has the most significant and negative impact on team performance (B= -4.696, p= .002). This indicates that team performance decreases with an increased level of team centralisation. The value of the odds ratio Exp(B) shows that a one-unit (0.1)[16] increase in the centralisation degree leads to about a 99 percent reduction in the odds of a higher team performance. The model (R-square value) explains 7.2 percent of the variance in the performance of Slovenian teams (Table 4.9).

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[16] Centralisation degree varies between 0 (minimum) and 1 (maximum)

Table 4.9: Advice network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Centralisation (in-degree)	-4.696	1.486	.002***	.009	.072
	Constant	.712	.264	.007	2.037	

*p<.1, **p<.05, ***p<.01

N = 185 units

Table 4.9 shows the statistical characteristics of centralisation degree as the only network characteristic of teams with a significant influence on team performance.

Table 4.10: Advice network characteristics of the Slovenian teams with no significant influence on team performance

		Score	Sig.
Step 1	Variables		
	Density with valued ties	.232	.630
	Multiplexity	.115	.734
	Ties to other teams	.162	.687
	Ties to other leaders	.132	.717
	Overall Statistics	.690	.952

Table 4.10 shows those advice network characteristics of teams, their scores and p-values that had no significant impact on team performance and were therefore excluded from the equation.

The results of the logistic regression analysis show that size is the only organisational characteristic and density with valued ties the only advice network characteristic of teams with a significant influence on team performance (Model 1 and Model 2).

Model 1: Organisational characteristics (size) $\Longrightarrow$ Team performance

Model 2: Advice network characteristics (centralisation) $\Longrightarrow$ Team performance

Finally, we examined the impact of the advice network characteristics[17] of the Slovenian teams on team performance (analysis 1) by controlling for the teams' demographic and organisational characteristics. The results of the logistic regression analysis show that team size as organisational characteristics has the most statistically significant and negative influence on team performance (B= -0.106, p= .001), indicating that team performance decreases with team size. The value of the odds ratio Exp(B) shows that each new team member to a present team leads to about an 10 percent decrease in the odds of a higher team performance. The model (R-square value) explains 7.8 percent of the variance in the performance of the Slovenian teams (Table 4.11).

Table 4.11: Demographic/organisational and advice network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.106	.033	.001***	.899	.078
	Constant	1.194	.390	.002	3.300	

*p<.1, **p<.05, ***p<.01

N = 185 units

Table 4.11 shows the statistical characteristics of team size as the only characteristics of the Slovenian teams with a significant influence on team performance.

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[17] We had to change the set of independent advice network variables, similarly as in analysis 1, and exclude ties to other teams from the logistic regression analysis due to the strong correlation with size (p= .831) as indicated in the bivariate analysis.

Table 4.12: Demographic/organisational and advice network characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 2	Variables	Gender	.011	.917
		Age	.361	.548
		Education	.868	.648
		Education (1)	.501	.479
		Education (2)	.827	.363
		Team tenure	.750	.386
		Professional background	1.611	.204
		Team typology	.698	.403
		Density with valued ties	1.345	.246
		Centralisation (in-degree)	2.720	.099
		Multiplexity	2.438	.118
		Ties to other leaders	.005	.944
	Overall Statistics		6.798	.815

Table 4.12 shows those demographic/organisational and advice network characteristics of the Slovenian teams, their scores and p-values that had no significant impact on team performance.

Figure 4.2: Impact of advice network characteristics on team performance by controlling for the demographic and organisational characteristics of the Slovenian teams (Model 1)
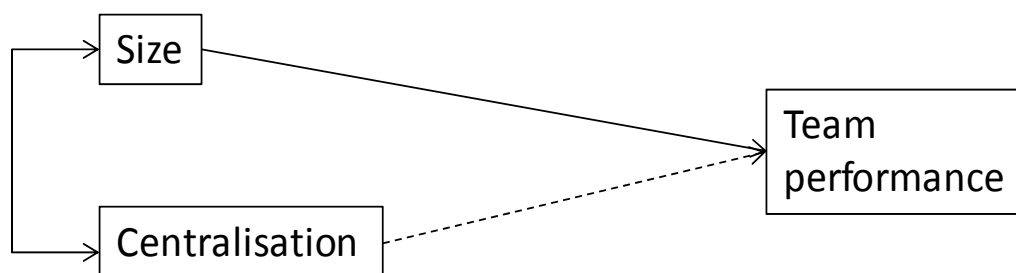
Figure 4.2 shows the results of the bivariate and multivariate analysis on the impact of the demographic/organisational and advice network characteristics of the Slovenian teams on team performance. The results indicate size is the strongest predictor of team performance,

while the influence of centralisation[18] becomes insignificant when we control for the teams' demographic and organisational characteristics. This is due to the strong positive correlation between size and centralisation (p= .633). Centralisation also strongly and inversely correlates with density with valued ties (p= -.861) so the influence of density is excluded from the regression analysis (Table 4.9). The centralisation degree in the advice networks has no impact on the success of the teams since centralised networks are not cohesive and are therefore less effective. The success of the teams is only influenced by size, indicating that smaller teams perform better.

4.1.4 Multivariate (binary logistic regression) analysis – analysis 2

We also tested the impact of the demographic/organisational and advice network characteristics on team performance for the most and least effective Slovenian teams (analysis 2). Similarly as in analysis 1, we first tested the impact of the demographic and organisational characteristics on team performance, then we tested the impact of advice network characteristics and finally we examined the impact of advice network characteristics on team performance by controlling for the demographic and organisational characteristics of the teams.

The demographic and organisational characteristics we included in analysis 2 are gender, age, education, team tenure, size, professional background and team typology. We defined the ranking for the education variable; a university degree represents parameter (1) and master's and doctoral degree represents parameter (2). The results of the logistic regression analysis on the influence of the demographic and organisational characteristics show that size is the only variable with a significant and negative impact on team performance (B= -

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[18] The influence of centralisation on team performance is presented in Figure 4.2 with a dotted line because in the multivariate analysis centralisation loses its impact on team performance. Centralisation in the bivariate analysis negatively correlates with team performance, but this is a 'spurious' relationship because of the size that correlates with centralisation (larger networks have a greater need for coordination through a centralised structure of relationships) and team performance.

0.138, p= .001). This indicates that team performance decreases with team size. The value of the odds ratio Exp(B) shows that each new team member to a present team leads to about a 13 percent decrease in the odds of a higher team performance. The model (R-square value) explains 12.6 percent of the variance in the dependent variable (team performance) (Table 4.13).

Table 4.13: Demographic and organisational characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.138	.043	.001***	.871	.126
	Constant	1.559	.502	.002	4.752	

*p<.1, **p<.05, ***p<.01
N = 123 units

Table 4.13 shows the statistical characteristics of size as the only demographic/organisational characteristic of teams with a significant influence on team performance.

Table 4.14: Demographic and organisational characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 1	Variables	Gender	1.774	.183
		Age	.854	.355
		Education	2.029	.363
		Education (1)	.103	.748
		Education (2)	1.466	.226
		Team tenure	2.342	.126
		Professional background	2.345	.126
		Team typology	.343	.558
	Overall Statistics		6.982	.431

Table 4.14 shows those demographic and organisational characteristics of teams, their scores and p-values that had no significant impact on team performance.

To test the impact of the advice network characteristics of the Slovenian teams on team performance (analysis 2), in the analysis we included density with valued ties, centralisation (in-degree), multiplexity, ties to other teams and ties to other team leaders. The results of the logistic regression analysis show that density with valued ties (cohesion) has the most significant and positive impact on team performance (p= .002). This indicates that team performance increases with cohesion. The value of the log-odds (B) indicates that for a one-unit (0.1)[19] increase in the level of team cohesiveness, the log odds of higher team effectiveness increase by 3.829. The model (R-square value) explains 11.6 percent of the variance in the performance of the Slovenian teams (Table 4.15).

Table 4.15: Advice network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1[a]	Density with valued ties	3.829	1.176	.001***	46.022	.116
	Constant	-1.820	.592	.002	.162	

*p<.1, **p<.05, ***p<.01

N = 123 units

Table 4.15 shows the statistical characteristics of density with valued ties as the only network characteristic of teams with a significant influence on team performance.

Table 4.16: Advice network characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 1	Variables	Centralisation (in-degree)	.679	.410
		Multiplexity	1.238	.266
		Ties to other teams	.017	.898
		Ties to other leaders	.030	.863
	Overall Statistics		1,728	.786

*p<.1, **p<.05, ***p<.01; N = 123 units

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[19] Level of cohesiveness varies between 0 (minimum) and 1 (maximum)

Table 4.16 shows those advice network characteristics of teams, their scores and p-values that had no significant impact on team performance.

The results of the logistic regression analysis indicate that size is the only organisational characteristics and density with valued ties the only advice network characteristics of teams with significant influence on team performance (Model 1 and Model 2).

Model 1: Organisational characteristics (size)   ⟹   Team performance
Model 2: Advice network characteristics (density with valued ties) ⟹ Team performance

In the third step, we examined the impact of the advice network characteristics[20] of the Slovenian teams on team performance (analysis 2) by controlling for the teams' demographic and organisational characteristics. The results of the logistic regression analysis show that the organisational characteristics such as team tenure as well as advice networks such as density with valued ties significantly influence the performance of the Slovenian teams. Team tenure has a weak (p= .068) and density with valued ties has a strong (p= .000) and positive influence on team success, indicating that team effectiveness increases with team tenure and the level of cohesiveness. The value of the odds ratio Exp(B) for team tenure shows that every additional year spent in a team leads to about a 6.5 percent increase in the odds of a higher team performance, while the value of the log-odds (B) for cohesion indicates that for a one-unit (0.1) increase in the level of team cohesiveness the log odds of higher team effectiveness increase by 4.664. The model (R-square value) explains 17.5 percent of the variance in the performance of the Slovenian teams (Table 4.17).

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[20] We had to change the set of independent advice network variables, similarly as in the analysis 1, and exclude ties to other teams from the logistic regression analysis because of strong correlation with size (p= .831) as indicated in the bivariate analysis.

Table 4.17: Demographic/organisational and advice network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 2	Team tenure	.063	.034	.068*	1.065	.175
	Density with valued ties	4.664	1.301	.000***	106.048	
	Constant	-2.599	.719	.000	.074	

*p<.1, **p<.05, ***p<.01

N = 123 units

Table 4.17 shows the statistical characteristics of cohesion (density with valued ties) and team tenure as the only organisational and network characteristics of teams with a significant influence on team performance.

Table 4.18: Demographic/organisational and advice network characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 2	Variables	Gender	1.959	.162
		Age	.042	.838
		Education	1.502	.472
		Education (1)	.549	.459
		Education (2)	.137	.711
		Size	1.644	.200
		Professional background	.772	.380
		Team typology	1.831	.176
		Centralisation	.476	.490
		Multiplexity	.520	.471
		Ties to other leaders	.021	.884
	Overall Statistics		10.097	.522

Table 4.18 shows those demographic/organisational and advice network characteristics of the Slovenian teams, their scores and p-values that had no significant impact on team performance.

Figure 4.3: Impact of advice network characteristics on team performance by controlling for the demographic and organisational characteristics of the Slovenian teams (Model 2)
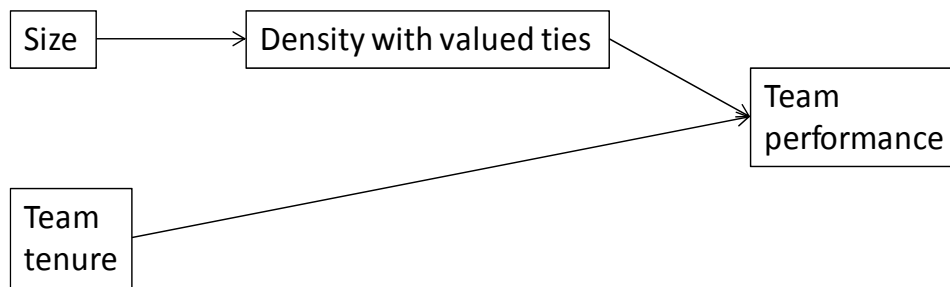
Figure 4.3 shows the results of the bivariate and multivariate analysis on the impact of the demographic/organisational and advice network characteristics of the Slovenian teams on team performance. The results indicate that density with valued ties (cohesion) and team tenure are the strongest predictors of team performance. The analyses also show that cohesion mediates the influence of size. Large networks have a lower level of cohesiveness, as indicated in the multivariate analysis. The most effective teams are thus characterised by a high level of network cohesiveness and longer team tenure.

Figure 4.4: Cohesive advice network of Slovenian team A
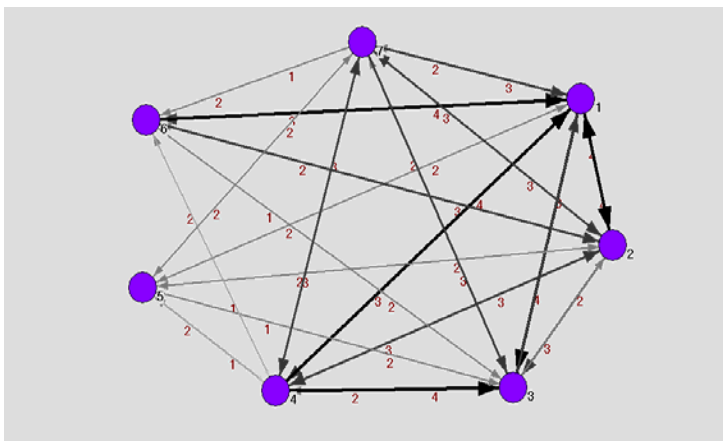
Figure 4.4 shows an example of the cohesive advice network of successful Slovenian team A.

The results of analysis 1 on the influence of advice networks on team performance by controlling for the teams' demographic and organisational characteristics become even more precise and clear with analysis 2. In analysis 1, size has the most significant impact on team performance while advice networks, like the degree of centralisation, become insignificant. However, in analysis 2 the advice network characteristics of teams, such as density with valued ties, mediate the influence of team size and most strongly impact the success of the teams, along with team tenure. This indicates that when teams involve a greater contrast regarding their effectiveness, size as an organisational characteristic is no longer the most important predictor of team performance but has an indirect impact on the success of teams via the level of team cohesiveness.

4.2   Team effectiveness and socialising network

In this chapter we present a research model (Figure 4.5) for measuring the influence of teams' demographic/organisational characteristics and socialising networks of the Slovenian teams as independent variables on team performance as a dependent variable. We tested the research model, similarly as for the advice network, by applying three different data analysis approaches; correlations, a group comparison approach and regression analysis. With bivariate analysis, we examined the correlations among different groups of measures and compared the characteristics of the teams according to their performances (group comparison approach). We tested the proposed hypotheses H1b, H2b and H3 (Chapter 2.5) on the impact of socialising networks on team performance, controlling for demographic/organisational measures, by applying a multivariate (regression) analysis.

Figure 4.5: Research model for data analysis in the socialising network of the Slovenian teams

Demographic and organisational measures   **Socializing network measures**

Gender
Age
Education
Team tenure
Size
Professional background
Team typology

Density with valued ties
Centralisation
Ties to other teams
Ties to other leaders

Team performance
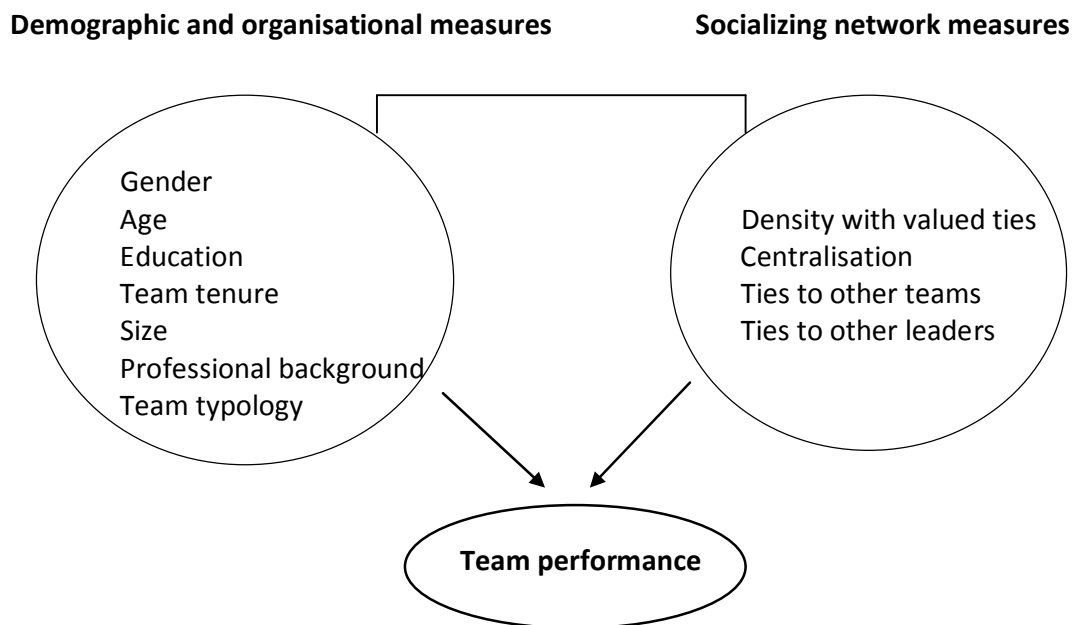
Descriptive characteristics of the socialising network of the Slovenian teams

Slovenian teams have in the socialising network (Table 4.19) moderate density (0.50, SD= .282), low cohesiveness (0.17, SD= .164), a low centralisation all-degree (0.29, SD= .176) and a moderate eigenvector centralisation degree (0.43, SD= .259). Team members are connected by weak socialising ties (the average tie strength is 1.18, SD= .529) and have more bridging ties to other teams (21 socialising ties) than to other team leaders (five socialising ties).

Table 4.19: Socialising network characteristics of the Slovenian teams

	N	Minimum	Maximum	Mean	Std. Deviation
Density	26	.00	1.00	.5010	.28209
Density with valued ties	26	.00	.86	.1713	.16370
Strength of ties	26	.0	3.4	1.186	.5297
Centralisation (all-degree)	26	.00	.68	.2968	.17661
Centralisation (betweenness)	26	.000	.580	.15192	.154192
Eigenvector centralisation	26	.00	.99	.4345	.25940
Ties to other teams	26	2	47	20.85	13.166
Ties to other leaders	26	0	33	5.27	6.856

Half of the Slovenian team members socialise after work, but few members do so more often than once a month (low cohesion and weak ties). The teams have a more centralised (all-degree) socialising network structure, which means there are few team members who are more popular to go out with after work (eigenvector centralisation). Less than half of the central team members socialise with other central team members, while all members socialise outside their team more with members of other teams than with other team leaders.

4.2.1 Bivariate analysis 1 – correlations

Using correlations (Appendix B.1) we examined which demographic/organisational and socialising network characteristics are significantly related to team effectiveness (analysis 1 and analysis 2).

Table 4.20: Descriptive statistics and correlations in the socialising networks of the Slovenian teams

	Min	Max	Mean	Std. Deviation	1	2	3	4	5	6	7	8	9	10	11
1.Gender	1	2	1.24	.43											
2.Age	0	1	.55	.49	.060										
3.Education	0	2	1.03	.56	.057	.-146**									
4.Team tenure	.2	32	6.02	5.55	.228**	.128	.001								
5.Size	4	22	9.19	4.17	-.191**	-.007	.197**	.031							
6. Professional background	0	7	3.19	1.87	-.105	-.009	.318**	-.037	.311**						
7.Team typology	1	2	1.67	.47	-.203*	-.076	.291**	.015	.595**	.495**					
8.Density with valued ties	.00	.86	.16	.16	.133	.020	.049	-.046	-.400**	.177*	-.317**				
9.Eigenvector centralization	.00	.99	.47	.26	-.123	-.036	-.144*	.022	.484**	-.051	.215**	-.528**			
10.Ties to other teams	2	47	23.17	13.61	-.216**	-.091	-.095	-.153*	.299**	-.108	.233**	-.167*	.233**		
11.Ties to other team leaders	0	33	4.48	5.98	.168*	-.100	-.019	.149*	-.307**	-.114	-.065	-.043	-.065	.077	
12.Team effectiveness (analysis 1)	0	1	.50	.501	.040	.031	.056	.063	-.233**	-.168*	-.129	.170*	-.129	-.015	.045
13. Team effectiveness (analysis 2)	0	1	.50	.502	.164	.062	-.173*	.130	-.265**	-.201*	-.177*	.221*	-.177*	.022	.081

*Correlation is significant at the 0.05 level, ** Correlation is significant at the 0.01 level

Table 4.20 shows the descriptive statistics and correlations of the demographic/organisational measures (gender, age, education, team tenure, size, professional background and team typology), the socialising network measures (density with valued ties, centralisation, ties to other teams and ties to other leaders) and effectiveness of the Slovenian teams we included in bivariate and multivariate analyses.

Relationship between demographic/organisational characteristics and team performance

In this chapter we are interested in how the demographic and organisational characteristics correlate with team performance (Table 4.20).

All of the demographic and organisational variables that significantly correlate with team performance; education (R= -0.173, p= .049 in analysis 2), size (R= -0.223, p= .002 in analysis 1 and R= -0.265, p= .002 in analysis 2), professional background (R= -0.166, p= .021 in analysis 1 and R= -0.198, p= .023 in analysis 2) and team typology (R= -0.215, p= .003 in analysis 1 and R= -0.235, p= .007 in analysis 2), have a negative influence on the teams' success. Successful teams are small in size, defined as work teams, team members have a lower educational level and fewer members come from other organisations (diverse professional background).

Gender, age and team tenure have no significant impact on team performance, but correlate among each other and, since they represent important demographic and organisational characteristics of the teams, we included them in a multivariate regression analysis. Gender is significantly and positively related to team tenure (R= 0.228, p= .002) and negatively to size (R= -0.191, p= .008) and team typology (R= -0.203, p= .005). The age of team members is significantly and negatively correlated to education (R= -0.146, p= .043) and positively to organisational tenure (R= 0.477, p= .000). The women had been present in their teams for a longer time than the men and work in smaller teams, defined as work teams. Older team members are less educated than younger team members and had worked for their organisations for a longer time. Team tenure only positively correlates with organisational tenure (R= 0.449, p= .000), meaning that team members who had been part of their organisations for a longer time had also been members of their teams for a longer time.

Relationship between socialising network characteristics and team performance

In this chapter we are interested in how the socialising network characteristics correlate with team performance (Table 4.20).

Density, density with valued ties and strength of ties, similarly as for the teams' advice network, significantly and positively correlate[21]. Both density measures also have a positive impact on team effectiveness and we therefore only included density with valued ties in the multivariate analysis. Density with valued ties (cohesion) is significantly and negatively related to different centralisation measures; all-degree centralisation (R= -0.407, p= .000), betweenness centralisation (R= -0.249, p= .000) and eigenvector centralisation (R= -0.528, p= .000) and positively to team performance (R= 0.170, p= .018 in analysis 1; R= 0.221, p= .011 in analysis 2). In cohesive teams, there are no central team members who are more popular or would act as an intermediary between other members who do not socialise among each other. Cohesive teams are also more effective than less cohesive teams.

Centralisation measures, similarly as with the teams' advice network, significantly and positively correlate between each other and since they all measure the same thing[22], albeit only eigenvector centralisation has an impact on team effectiveness (R= -0.177, p= .043 in analysis 2), we only included teams' social networks eigenvector centralisation in further analyses. Teams with a lower eigenvector centralisation degree perform better.

Ties to other teams have no significant impact on team performance, but correlate with other network measures and, because they represent an important socialising network characteristic of teams – bridging ties – we included them in the multivariate regression analysis. Ties to other teams significantly negatively correlate with density with valued ties (R= -0.167, p= .019) and significantly positively with eigenvector centralisation (R= 0.233, p= .001). On the other hand, ties to other leaders significantly correlate only with demographic characteristics of teams.

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[21] The Cronbach Alpha of density, density with valued ties and strength of ties in the socialising network is 0.759, which means that both network variables measure the same thing (Appendix B.8).

[22] The Cronbach Alpha of all-degree centralisation, betweenness centralisation and eigenvector centralisation in the socialising network is 0.564 (Appendix B.8).

Relationship between socialising network and demographic/organisational characteristics

In this chapter we consider how the socialising network characteristics correlate with the demographic and organisational characteristics of the teams (Table 4.20).

Density with valued ties significantly negatively correlates with size (R= -0.400, p= .000) and team typology (R= -0.317, p= .000) and significantly positively with a diverse professional background (R= 0.177, p= .014). These results show that cohesive teams are small in size, categorised as work teams and include team members who have diverse professional backgrounds.

Eigenvector centralisation significantly negatively correlates with education (R= -0.144, p= .046) and significantly positively correlates with size (R= 0.484, p= .000) and team typology (R= 0.215, p= .003). Teams where central members socialise with other central members are large in size, have members with a lower educational level and are categorised as project teams.

Ties to other teams significantly negatively correlate with gender (R= -0.216, p= .003) and team tenure (R= -0.153, p=.035) and positively with size (R= 0.299, p= .000) and team typology (R= 0.217, p= .003). Men socialise more with members of other teams than women and teams with socialising ties to other teams are large in size, defined as project teams and have members who are relatively new in their teams.

Ties to other leaders significantly and positively correlate with gender (R= 0.168, p= .020) and team tenure (R= 0.149, p= .040) and negatively with size (R= -0.307, p= .000). Women socialise more with leaders of other teams than men; teams with socialising ties to other leaders are small in size and have members who have been present longer in their teams.

Results of the correlations show that density with valued ties significantly positively and eigenvector centralisation significantly negatively correlates with team performance, while ties to other teams and ties to other team leaders have no significant impact on the success of teams. Socialising networks correlate with demographic and organisational characteristics, especially density with valued ties, centralisation and ties to other teams

which significantly correlate with size and team typology. Ties to other teams and other team leaders also significantly correlate with gender and team tenure. Regarding team typology, we categorised Slovenian teams as work and project teams (Chapter 3.6) and the results of the correlations show that Slovenian project teams are large in size, more centralised, less cohesive and have more bridging ties to other teams.

4.2.2 Bivariate analysis 2 – a group comparison approach

In this chapter, similarly as for the advice network, the performance of the Slovenian teams is defined as groups of teams according to their effectiveness (Chapter 3.6). By applying a group comparison approach, we compared the demographic/organisational and socialising network characteristics of the more and less effective Slovenian teams (analysis 1) and of the most and least effective Slovenian teams (analysis 2). The more and most effective teams are defined as high performing teams and the less and least effective teams as low performing teams.

Basic characteristics of the high and low performing Slovenian teams

The demographic characteristics of the high and low performing teams are similar, the majority of team members are men aged between 40–55 years and holding a university degree. The organisational characteristics of the high and low performing teams involve greater differences.

More effective teams are smaller (9 members vs. 10 members per team on average), team members have a longer average team tenure (6 years vs. 5 years) and fewer members have a diverse professional background (3 vs. 4) compared to less effective teams. More effective teams are defined as work teams and have a higher level of team autonomy (4 vs. 4.15)[23] than less effective teams, categorised as project teams (Appendix B.2). The most effective teams are similarly smaller than the least effective teams (8 members vs. 11 members), the teams do not differ much regarding team tenure (5.3 years vs. 5.4 years) and fewer

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[23] higher level of self-management

members have a diverse professional background (3 vs. 4) than in the least effective teams. The most effective teams are categorised as work teams and have a higher level of team autonomy (4.14), while the least effective teams are defined as project teams and have a lower level of team autonomy (3.93; Appendix B.3).

Descriptive characteristics of the socialising networks of high and low performing Slovenian teams

More effective teams (Appendix B.6) have in their socialising network a higher density (0.54 vs. 0.45), are more cohesive (0.20 vs. 0.14), the teams have a higher betweenness centralisation (0.155 vs. 0.149) and lower eigenvector centralisation (0.42 vs. 0.45) compared to the less effective teams. The teams do not differ much regarding all-degree centralisation (0.30 vs. 0.29) and the strength of ties[24] (1.3 vs. 1.1). More effective teams have more socialising ties to other teams (23 vs. 19) and other leaders (6 vs. 4).

The most effective teams (Appendix B.7) have a higher density than the least effective teams (0.61 vs. 0.50), are more cohesive (0.25 vs. 0.16) and their team members are connected by stronger socialising ties (1.4 vs. 1.2), although the team members still socialise less than once a month. The most effective teams have a lower all-centralisation degree (0.28 vs. 0.30) and lower eigenvector centralisation (0.34 vs. 0.53), but higher betweenness centralisation (0.186 vs. 0.148). In the most effective teams, team members socialise more with other teams (24 socialising ties vs. 20 socialising ties) and more with other leaders (7 socialising ties vs. 4 socialising ties) than members of the least effective teams.

The results of the group comparison approach show that the socialising networks of the high performing Slovenian teams are characterised by a higher level of cohesion, lower degree of centralisation and a higher number of socialising ties to other teams and other team leaders compared to the low performing Slovenian teams.

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[24] Team members socialise less than once a month

4.2.3 Multivariate (binary logistic regression) analysis – analysis 1

With the multivariate analysis we tested the research model on the impact of the demographic/organisational and socialising network characteristics of the teams on team performance and tested the proposed hypotheses H1b, H2b and H3. Team performance is, similarly as for the advice network, defined as an ordinal variable (0, 1) and so we applied a binary logistic regression analysis. We first examined the impact of the demographic and organisational characteristics on team performance, then we tested the influence of socializing network characteristics and then we examined the impact of the network characteristics on team performance by controlling for the demographic and organisational characteristics of the Slovenian teams.

The demographic and organisational characteristics we included in the analysis are gender, age, education, team tenure, size, professional background and team typology. Education is the only variable with three categories (elementary, vocational and high school, university degree and master's and doctoral degree) so in the logistic regression analysis we defined the ranking for the education variable; a university degree represents parameter (1) and a master's and doctoral degree represents parameter (2) (Table 4.21).

Table 4.21: Education parameter coding

| | | Frequency | Parameter coding | |
			(1)	(2)
Education	Elementary, vocational and high school	27	,000	,000
	University degree	126	1,000	,000
	Master's and doctoral degree	32	,000	1,000

Results of the logistic regression analysis on the influence of the demographic and organisational characteristics show that size is the only variable with a significant and negative impact on team performance (B= -0.106, p= .001). This indicates that team performance decreases with team size. The value of coefficient (B) shows that for a one-unit

(team member) increase in team size the log odds of a higher team performance decreases by 0.106. The value of the odds ratio Exp(B) is similar to B, but a more straightforward concept and shows that each new team member that is added to a present team leads to about a 10 percent reduction in the odds of a higher team performance. The model (R-square value) explains 7.8 percent of the variance in the dependent variable (team performance) (Table 4.22).

Table 4.22: Demographic and organisational characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.106	.033	.001***	.899	.078
	Constant	1.194	.390	.002	3.300	

*p<.1, **p<.05, ***p<.01

N = 185 units

Table 4.22 shows size as the only demographic/organisational characteristic of the Slovenian teams with a significant influence on team performance and its statistical characteristics such as coefficients (B or log-odds), their standard errors (S.E.), p-values (Sig.) and the exponentiated coefficient as an odds ratio Exp(B). Nagelkerke R Square as a pseudo R-square presents the proportion of the explained variance in the dependent variable.

Table 4.23: Demographic and organisational characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 1	Variables	Gender	.011	.917
		Age	.361	.548
		Education	.868	.648
		Education (1)	.827	.363
		Education (2)	.230	.632
		Team tenure	.750	.386
		Professional background	1.611	.204
		Team typology	.698	.403
	Overall Statistics		4.227	.753

Table 4.23 shows those demographic and organisational characteristics of teams, their scores and p-values that had no significant impact on team performance and were therefore excluded from the equation.

To test the impact of the socializing network characteristics of the Slovenian teams on team performance (analysis 1), in the analysis we included density with valued ties, centralisation (all-degree), ties to other teams and ties to other team leaders. The results of the logistic regression analysis show that density with valued ties (cohesion) has the most significant and positive impact on team performance (p= .002), when looking only at social networks. The value of the log-odds (B) indicates that for a one-unit (0.1)[25] increase in the level of team cohesiveness, the log odds of higher team effectiveness increase by 2.519. The model (R-square value) explains 4 percent of the variance in the performance of the Slovenian teams (Table 4.24).

Table 4.24: Socialising network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Density with valued ties	2.519	1.148	.028	12.422	.041
	Constant	-.370	.219	.092	.691	

*p<.1, **p<.05, ***p<.01

N = 185 units

Table 4.24 shows the statistical characteristics of density with valued ties as the only network characteristic of teams with a significant influence on team performance.

Table 4.25: Socialising network characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 1	Variables	Centralisation (all degree)	.643	.423
		Ties to other teams	.073	.787
		Ties to other leaders	.492	.483
	Overall Statistics		.816	.846

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[25] Level of cohesiveness varies between 0 (minimum) and 1 (maximum)

Table 4.25 shows those socialising network characteristics of teams, their scores and p-values that had no significant impact on team performance and were therefore excluded from the equation.

The results of the regression analysis indicate that size is the only organisational characteristics and density with valued ties the only socializing network characteristics of the Slovenian teams with significant influence on team performance (Model 1 and Model 2).

Model 1: Organisational characteristics (size) ⟹ Team performance

Model 2: Socializing network characteristics (density with valued ties) ⟹ Team performance

When we examined the impact of the Slovenian teams' social networks on team performance by controlling for the teams' demographic and organisational characteristics, the results showed that size is the most important characteristic of successful teamwork (B= -0.105, p=.002). The value of the odds ratio Exp(B) shows that each new team member that joins a present team leads to about a 10 percent decrease in the odds of a higher team performance. The model (R-square value) explains 7.7 percent of the variance in the dependent variable (Table 4.26).

Table 4.26: Demographic/organisational and socialising network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.105	.033	.002***	.900	.077
	Constant	1.174	.390	.003	3.235	

p<.1, **p<.05, ***p<.01

N = 185 units

Table 4.26 shows the statistical characteristics of team size as the only characteristic of the Slovenian teams with a significant influence on team performance.

Table 4.27: Demographic/organisational and socialising network characteristics of the Slovenian teams with no significant influence on team performance

		Score	Sig.
Step 1	Variables		.375
	Gender	.004	.951
	Age	.459	.498
	Education	.012	.913
	Team tenure	.846	.358
	Professional background	1.045	.307
	Team typology	1.691	.193
	Density with valued ties	.786	.375
	Centralisation	.095	.758
	Ties to other teams	.178	.673
	Ties to other leaders	.019	.889
	Overall Statistics	6.332	.787

Table 4.27 shows those demographic/organisational and socialising network characteristics of teams, their scores and p-values that had no significant impact on team performance and were thus excluded from the equation.

Figure 4.6: Impact of socializing network characteristics on team performance by controlling for the demographic and organisational characteristics of the Slovenian teams (Model 1)
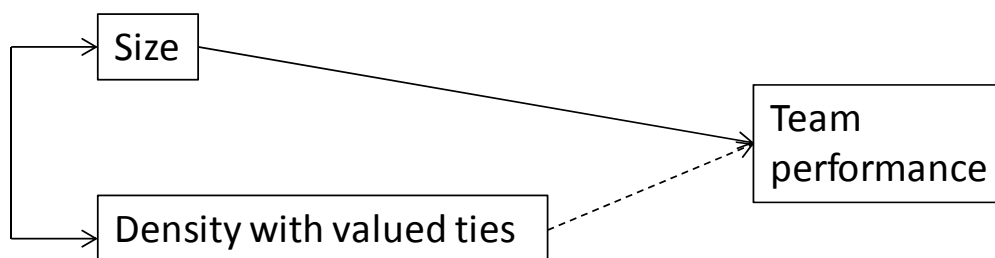
Figure 4.6 shows the results of the bivariate and multivariate analysis on the impact of the Slovenian teams' demographic/organisational and socialising network characteristics on team performance. The bivariate analyses indicate that size and cohesion are the most important independent characteristics of the teams. Both measures also significantly and

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inversely correlate and we can interpret their relationship as the influence of size on the cohesion. The results of the multivariate analysis show that the impact of size on the teams' performance is stronger than the impact of cohesion.

4.2.4 Multivariate (binary logistic regression) analysis – analysis 2

We also tested the impact of the socialising network characteristics on team performance for the most and least effective Slovenian teams (analysis 2). We first tested the influence of demographic and organisational characteristics on team performance then we tested the influence of the socialising network characteristics and the impact of the socialising networks by controlling for the teams' demographic and organisational characteristics.

The demographic and organisational characteristics we included in analysis 2 are gender, age, education, team tenure, size, professional background and team typology. We defined the ranking for the education variable; a university degree represents parameter (1) and master's and doctoral degree represents parameter (2). The results of the logistic regression analysis on the influence of the demographic and organisational characteristics show that size is the only variable with a significant and negative impact on team performance (B= -0.138, p= .001). This indicates that team performance decreases with team size. The value of the odds ratio Exp(B) shows that each new team member to a present team leads to about a 13 percent decrease in the odds of a higher team performance. The model (R-square value) explains 12.6 percent of the variance in the dependent variable (team performance) (Table 4.28).

Table 4.28: Demographic and organisational characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.138	.043	.001***	.871	.126
	Constant	1.559	.502	.002	4.752	

*p<.1, **p<.05, ***p<.01

 N = 123 units

Table 4.28 shows the statistical characteristics of size as the only demographic/organisational characteristic of teams with a significant influence on team performance.

Table 4.29: Demographic and organisational characteristics of the Slovenian teams with no significant influence on team performance

		Score	Sig.
Step 1 Variables	Gender	1.774	.183
	Age	.854	.355
	Education	2.029	.363
	Education (1)	.103	.748
	Education (2)	1.466	.226
	Team tenure	2.342	.126
	Professional background	2.345	.126
	Team typology	.343	.558
	Overall Statistics	6.982	.431

Table 4.29 shows those demographic and organisational characteristics of the Slovenian teams, their scores and p-values that had no significant impact on team performance and were therefore excluded from the equation.

The results of the logistic regression analysis show similar results as in analysis 1; density with valued ties (cohesion) has the most significant and positive impact on team performance (p= .025). Team performance therefore increases with cohesion. The value of the log-odds (B) indicates that for a one-unit (0.1)[26] increase in the level of team cohesiveness the log odds of higher team effectiveness increase by 3.637. The model (R-square value) explains 7.3 percent of the variance in the performance of Slovenian teams (Table 4.30).

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[26] Level of cohesiveness varies between 0 (minimum) and 1 (maximum)

Table 4.30: Socialising network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Density with valued ties	3.637	1.618	.025**	37.992	.073
	Constant	-.544	.292	.063	.580	

*p<.1, **p<.05, ***p<.01

N = 123 units

Table 4.30 shows the statistical characteristics of density with valued ties as the only network characteristic of teams with a significant influence on team performance.

Table 4.31: Socialising network characteristics of the Slovenian teams with no significant influence on team performance

			Score	Sig.
Step 1	Variables	Centralisation (all-degree)	.625	.429
		Ties to other teams	1.156	.282
		Ties to other leaders	1.009	.315
	Overall Statistics		2.502	.475

Table 4.31 shows those socialising network characteristics of teams, their scores and p-values that had no significant impact on team performance.

When we examined the impact of the Slovenian teams' social networks on team performance, by controlling for the teams' demographic and organisational characteristics, the results were again very similar to the results of analysis 1. Size is the most important characteristic of successful teamwork (B= -0.137, p=.001). The value of the odds ratio Exp(B) shows that each new team member that joins a present team leads to about a 12.8 percent decrease in the odds of a higher team performance. The model (R-square value) explains 12.4 percent of the variance in team effectiveness (Table 4.32).

Table 4.32: Demographic/organisational and socialising network characteristics of the Slovenian teams with a significant influence on team performance

		B	S.E.	Sig.	Exp(B)	Nagelkerke R Square
Step 1	Size	-.137	.043	.001***	.872	.124
	Constant	1.527	.503	.002	4.606	

*p<.1, **p<.05, ***p<.01

N = 123 units

Table 4.33: Demographic/organisational and socialising network characteristics of the Slovenian teams with no significant influence on team performance

		Score	Sig.
Step 1	Gender	1.898	.168
	Age	1.034	.309
	Education	2.004	.157
	Team tenure	2.537	.111
	Professional background	2.427	.119
	Team typology	.354	.552
	Density with valued ties	1.232	.267
	Centralisation	.498	.480
	Ties to other teams	1.552	.213
	Ties to other leaders	.066	.797
Overall Statistics		11.280	.336

Table 4.33 shows those demographic/organisational and socialising network characteristics of teams, their scores and p-values that had no significant impact on team performance and were thus excluded from the equation.

Figure 4.7: Impact of socializing network characteristics on team performance by controlling for the demographic and organisational characteristics of the Slovenian teams (Model 2)

Figure 4.7 shows the results of the bivariate and multivariate analysis on the impact of demographic/organisational and socialising network characteristics of the Slovenian teams on team performance. The results are similar to the results in analysis 1, indicating that size and cohesion are the most important independent characteristics of the teams. Both measures also significantly and inversely correlate and the results of the multivariate analysis reveal that the impact of size on the teams' performance is stronger than the impact of cohesion.

5 FINLAND

5.1 Team effectiveness and socialising network

In this chapter we present a research model for (Figure 5.1) for measuring the influence of the Finnish teams' demographic/organisational and socialising network characteristics as independent variables on team performance as a dependent variable. We tested the research model and the proposed hypotheses H1b, H2b and H3 (Chapter 2.5) by applying a bivariate analysis, correlations and a group comparison approach. With the correlations, we examined the relationship between the different groups of measures (demographic/organisational measures, socialising network measures and team performance) and with the group comparison approach we compared the teams' characteristics according to their performance (more and less effective teams). Due to the small research sample we were unable to perform a multivariate analysis.

Figure 5.1: Research model for data analysis in the socialising network of the Finnish teams

Demographic and organisational measures   **Socializing network measures**

Gender
Age
Education
Team tenure
Size
Professional background
Team typology

Density with valued ties
Centralisation
Ties to other teams
Ties to other leaders

Team performance

Basic characteristics of the Finnish teams

In the research on social networks of the Finnish teams we included 8 teams with 50 team members, with 3 teams coming from the public sector and being classified as project teams and 5 teams coming from the private sector and being classified as work teams. All teams come from large Finnish organisations with 250 to 500 employees. The Finnish teams have high average effectiveness (4.00, SD= .323) and a high average self-management level (3.63, SD= .319). Satisfaction with working in the present team is very high (92 percent) among members of the Finnish teams.

The majority of Finnish team members are women (70 percent), between 40-55 years or older (74 percent). Team members who are younger present 26 percent. University degree holds 12 percent of team members, 12 percent finished secondary education and 76 percent holds master' s degree or Ph.D (Table 5.1).

Table: 5.1: Demographic characteristics of the Finnish teams

		Frequency	Valid Percent
Gender	Men	15	30.0
	Women	35	70.0
Age			
	25-40 years	13	26.0
	40-55 years and more	37	74.0
Education			
	Elementary, vocational and high school	6	12.0
	University degree	6	12.0
	Master's degree and Ph.D.	38	76.0
	Total	50	100.0

The Finnish team members had been working for their organisations for an average of 10 years and had been members of their teams for an average of 4 years. The teams have eight members on average and half the members have a diverse professional background (Table 5.2).

Table 5.2: Organisational characteristics of the Finnish teams

	N	Minimum	Maximum	Mean	Std. Deviation
Organisational tenure	8	1.0	35.0	9.880	9.3222
Team tenure	8	.5	15.0	3.776	3.3324
Size	8	6	10	7.75	1.669
Professional background	8	2	6	3.88	1.727

The data from Tables 5.1 and 5.2 on the demographic and organisational characteristics of the Finnish teams show that the typical Finnish team in the research consists of team members who are in the majority women, highly educated, in their mature working age (40–55 years) and with a longer organisational and shorter team tenure. The Finnish teams are on average small in size and have members with diverse professional backgrounds.

The Finnish teams were, according to the nature of their work, defined as work and project teams (Table 5.3). Of the 8 Finnish teams in the research, we categorised 5 teams with 32 team members as work teams and 3 teams with 18 team members as project teams. Women in the Finnish work teams represent 65 percent and men 35 percent of team members, 77 percent of members are aged 40-55 years and above and 23 percent of members are between 25–40 years and younger. The majority of work team members have a master's degree or PhD (73 percent), 8 percent have a university degree and 19 percent have finished secondary education. In the project teams, women represent 75 percent and men 25 percent of members, 54 percent of members are between 25–40 years old and younger while 46 percent of members are aged 40–55 years and above. The majority of the Finnish team members (79 percent) hold a master's degree or PhD, 17 percent have a university degree and 4 percent finished the secondary educational level.

Table 5.3: Demographic characteristics of the Finnish work and project team members

| | | Team typology | | Total |
		Work teams	Project teams	
Gender	Men	9 (34.6%)	6 (25.0%)	15 (30.0%)
	Women	17 (65.4%)	18 (75.0%)	35 (70.0%)
	Total	26 (100.0%)	24 (100.0%)	50 (100.0%)
Age				
	under 25 and 25-40 years	6 (23.1%)	7 (29.2%)	13 (26.0%)
	40-55 years and more	20 (76.9%)	17 (70.8%)	37 (74.0%)
	Total	26 (100.0%)	24 (100.0%)	50 (100.0%)
Education				
	Elementary, vocational and high school	5 (19.2%)	1 (4.2%)	6 (12.0%)
	University degree	2 (7.7%)	4 (16.7%)	6 (12.0%)
	Master's degree and Ph.D.	19 (73.1%)	19 (79.1%)	38 (76.0%)
	Total	26 (100.0%)	24 (100.0%)	50 (100.0%)

The figures shown in Table 5.3 on the demographic characteristics of the Finnish work and project teams reveal there are more men in work teams than in project teams, while women are more present in work and project teams; the majority of members of work and project teams are in their mature working age (40–55 years) and have a very high level of education.

Descriptive characteristics of the socialising network of the Finnish teams

When we started to analyse the social network characteristics of the Finnish teams, we could only perform a data analysis on the teams' socialising network. Social network analysis requires a very high response rate (100 percent) and not all members of the Finnish teams included in the research responded to our questionnaire. We could therefore replace the missing data only in the case of socialising ties, where the direction of ties is not relevant. In the case of an advice network the direction of ties is important, but we did not have a reverse question for the advice-tie relationship in the Finnish teams as was the case in the later research on the Slovenian teams (Chapter 3.6).

In their socialising networks (Table 5.4), the Finnish teams have moderately low density (0.39, SD= .307), low cohesiveness (0.12, SD= .101), a moderately low centralisation all-degree (0.33, SD= .238) and a moderately low eigenvector centralisation degree (0.29, SD= .217), which means that central team members socialise more with other members who are also central in the team. Team members socialise after work less than once a month (the average tie strength is 0.92, SD= .580) and have more bridging ties to other teams (14 socialising ties) than to other leaders (5 socialising ties).

Table 5.4: Socialising network characteristics of the Finnish teams

	N	Minimum	Maximum	Mean	Std. Deviation
Density	8	.00	.87	.3943	.30751
Density with valued ties	8	.00	.28	.1237	.10127
Tie strength	8	.00	1.36	.9200	.58034
Centralisation (all-degree)	8	.00	.67	.3311	.23815
Eigenvector centralisation	8	.00	.59	.2942	.21764
Ties to other teams	8	4	50	14.00	15.185
Ties to other leaders	8	0	19	4.88	6.334

Less than half the Finnish team members socialise after work, but very few members do so more often than once a month (weak ties), so the team cohesion (density with valued ties) is very low. Teams have a more centralised (all-degree) socialising network structure and there are few team members who are more popular to go out with after work (eigenvector centralisation). Central team members also socialise more with other central team members, while all members socialise outside their team more with members of other teams than with other team leaders.

5.1.1 Bivariate analysis 1 – correlations

Using correlations (Appendix C) we examined which demographic/organisational and socialising network characteristics of the Finnish teams are significantly related to team effectiveness.

Table 5.5: Correlations in the socializing networks of the Finnish teams

	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Gender													
2.Age	.209												
3.Education	.356*	420**											
4.Team tenure	.049	.155	-.126										
5.Size	.054	-.084	-.067	-.214									
6. Professional background	.336*	.237*	.298*	.056	.114								
7.Team typology	.127	.065	.211	.039	-.745**	.134							
8.Density with valued ties	-.063	.255*	-.072	.243	.101	.156	-.484**						
9. Tie strength	.020	.289*	.053	.259	.233	.274	-.313*	.846**					
10.Centralisation (all-degree)	.074	.168	.126	.231	.344*	.113	-.078	.278	.727**				
11.Eigenvector centralisation	.030	.188	.129	.132	.302*	.194	-.026	.332*	.776**	.958**			
12.Ties to other teams	.162	.129	-.003	-.111	.422**	.525**	-.513**	.598**	.373*	-.165	-.099		
13.Ties to other team leaders	.153	.088	-.032	-.120	.528**	.516**	-.571**	.460**	.225	-.230	-.191	.949**	
14.Team effectiveness	.009	.002	-.016	-.460**	.177	.121	.191	-.011	.078	-.003	.187	.283*	.237

*Correlation is significant at the 0.1 level, ** Correlation is significant at the 0.01 level

Table 5.5 shows the correlations of demographic/organisational measures (gender, age, education, team tenure, size, professional background and team typology), socializing network measures (density with valued ties, tie strength, centralisation, ties to other teams and ties to other leaders) and effectiveness of the Finnish teams we included in the bivariate analysis.

Relationship between demographic/organisational and socializing network characteristics and team performance

The Finnish teams' demographic and organisational characteristics as well as their socializing network characteristics have a similarly strong, but less significant correlation with team performance compared to the Slovenian teams. The reason probably lies in the small sample size. Team tenure (R= -0.460, p= .001) and the bridging ties Finnish team members have with other teams (R= 0.283, p= .046) are the only variables that significantly correlate with team effectiveness. Teams with shorter team tenure and many connections to other teams are better performers.

Relationship between the socializing network and demographic/organisational characteristics of the Finnish teams

In the socialising network of the Finnish teams, density with valued ties positively correlates with tie strength (R= 0.846, p= .000) and they both significantly correlate with organisational tenure. The longer teams have worked for their organisations, the more they are cohesive (R= 0.425, p= .002) and the more often the members socialise (R= 0.300, p= .034). Density with valued ties significantly and negatively correlates with team typology (R= -0.484, p= .000), meaning that project teams are more cohesive than work teams.

Centralisation positively and significantly correlates with size (R= 0.344, p= .015), density (R= 0.287, p= .044) and tie strength (R= 0.727, p= .000). In teams where one or few members are more central are larger in size, the connectedness of the team members is stronger and the members more often socialise. Also the eigenvector centralisation of the Finnish teams positively and significantly correlates with size (R= 0.302, p= .033), cohesion (R= 0.332, p= .019), strength of ties (R= 0.776, p= .000) and centralisation (0.958, p= .000). Teams with a number of members who socialise with other central team members are larger, more cohesive, their team members socialise more often and the teams have one or few very central members.

Bridging ties to other teams and leaders significantly positively correlate with size, density with valued ties, tie strength and professional background and significantly negatively with team typology. Teams where members socialise with other teams are large (R= 0.422, p= .002), cohesive (R= 0.598, p= .000), the team members often socialise with each other (R= 0.373, p= .008) and have diverse professional backgrounds (R= 0.525, p= .000), while teams are categorised as work teams (R= -0.513, p= .000).

Teams where members socialise with the leaders of other teams also socialise with members of other teams (R= 0.949, p= .000), these teams are large in size (R= 0.528, p= .000), more cohesive (R= 0.460, p= .001), their members have diverse professional backgrounds (R= 0.516, p= .000) and are categorised as work teams (R= -0.571, p= .000).

Results of the correlations show that the demographic/organisational and socialising network characteristics have, except for team tenure and ties to other teams, no significant impact on the success of the Finnish teams. But the socialising networks correlate with the Finnish teams' demographic and organisational characteristics; density with valued ties correlates positively with organisational tenure and negatively with team typology; eigenvector centralisation correlates positively with size; ties to other teams and other team leaders positively correlate with size and professional background and negatively with team typology. The results of the correlations regarding team typology show that the Finnish project teams are smaller in size, less cohesive, have less bridging ties to other teams and other team leaders and shorter organisational tenure compared to the work teams.

5.1.2 Bivariate analysis 2 – a group comparison approach

In this chapter we compare the demographic/organisational and socialising network characteristics of the Finnish teams according to team performance. As described in Chapter 3.6, we categorised the teams in two groups; less and more effective teams. The group comparison approach provided us with a deeper insight into the characteristics of the successful Finnish teams. We define more effective teams as high performing teams and less effective teams as low performing teams.

Basic characteristics of the high and low performing Finnish teams

The demographic and organisational characteristics of the more and less effective teams (Appendix C.1) show that the majority of Finnish team members in both groups are women, aged between 40–55 years and more and with a high level of education (master's and PhD). More effective teams are defined as project teams with a shorter average team tenure (2.3 years vs. 5.3 years) and a higher level of self-management (3.79 vs. 3.46). The more and less effective teams do not differ regarding team size (8 members on average) and the number of members with a professional background (4).

Descriptive characteristics of the socialising networks of the high and low performing Finnish teams

In their socialising networks, the more effective Finnish teams have lower density (0.36 vs. 0.43), lower cohesiveness (0.11 vs. 0.14) and higher centralisation (0.34 vs. 0.32), especially regarding the eigenvector centralisation degree (0.34 vs. 0.25) compared to the less effective teams. Members of more and less effective teams are connected by weak socialising network ties (the tie strength is 0.93 and 0.91), meaning they socialise less than once a month. More effective teams have more bridging ties to other teams (17 ties vs. 11 ties per team) and more bridging ties to other leaders (6 ties vs. 4 ties per team) than the less effective Finnish teams (Appendix C.2).

The results of the group comparison approach regarding the characteristics of high and low performing Finnish teams indicate that teams do not vary regarding demographic characteristics, team size or members with a diverse professional background, but they differ regarding the team tenure, team typology and socializing network characteristics. The high performing Finnish teams are characterized by a short team tenure, low cohesiveness, high centralisation, a high number of bridging ties and regarding the nature of work defined as project teams (Figure 5.2).

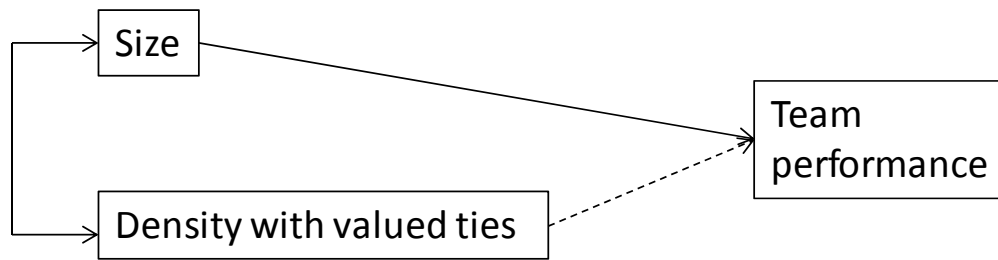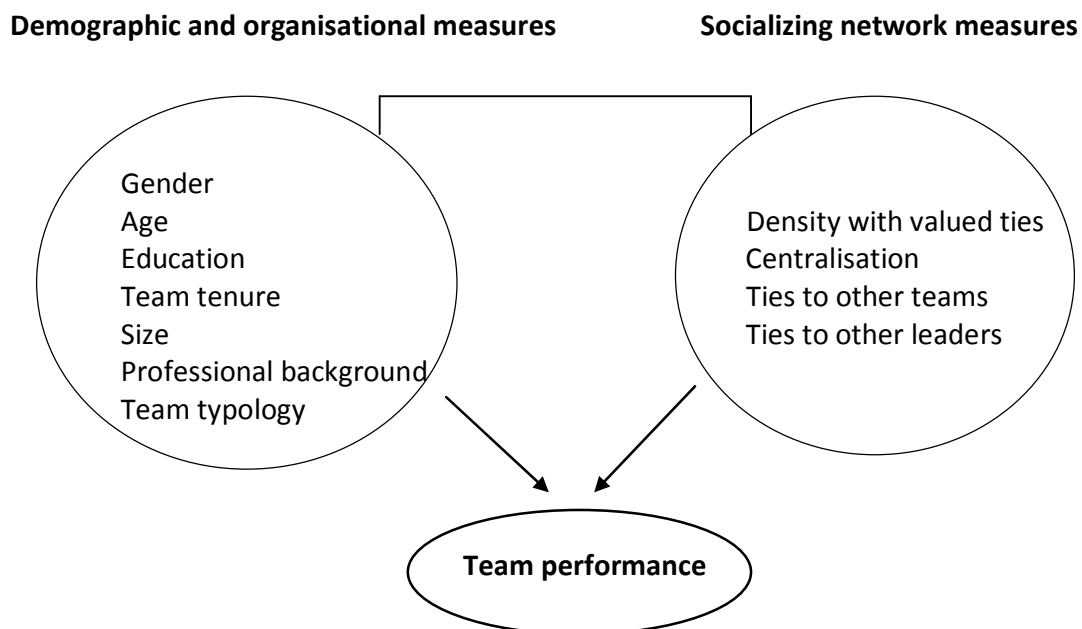Figure 5.2: Organisational and socializing network characteristics of the Finnish teams with an influence on team performance
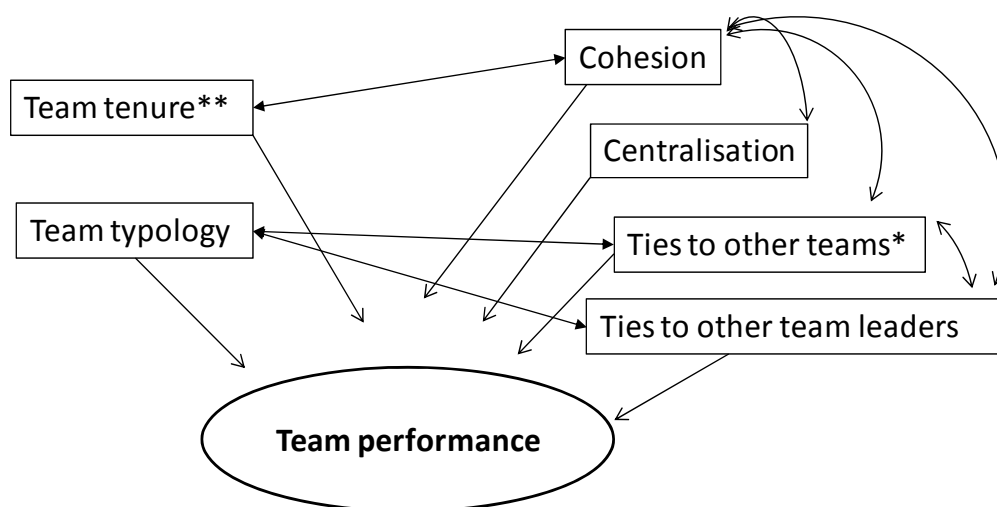
Figure 5.2 shows the results of the bivariate analysis on the impact of the demographic/organisational and socialising network characteristics of the Finnish teams on team performance. The results indicate that team tenure and ties to other teams significantly[27] influence team performance, while the success of the Finnish teams also depends on the level of cohesion, degree of centralisation, ties to other leaders and team typology. Figure 5.2 also shows that the organisational and social network characteristics of the Finnish teams significantly correlate between each other.

The successful Finnish and Slovenian teams are very different regarding their organisational and social network characteristics. In the Slovenian teams, team success depends on a higher level of team cohesiveness, lower centralisation degree and a longer team tenure, while in the Finnish teams the situation is the opposite – a stronger team performance is influenced by low cohesion, higher centralisation and a shorter team tenure. One reason can be found in the Finnish organisational culture, where team members enjoy a high level of individual and team autonomy, socialise with each other less often and are very goal-oriented at work, as was explained in the interviews with the Finnish HR managers. The Finnish teams might therefore have a greater need for coordination through a centralised structure of relationships.

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[27] *Correlation is significant at the 0.01 level, ** correlation is significant at the 0.05 level

6 SOCIAL NETWORKS OF THE TEAM LEADERS

In this chapter we present the demographic/organisational and social network characteristics of the Slovenian and Finnish team leaders and test the proposed hypotheses H4a and H4b (Chapter 2.5) on the influence of a central or prestigious position of team leaders on team performance by applying bivariate analysis such as correlations and a team leader comparison approach. The correlations allowed us to examine the relationship between the different groups of measures (demographic/organisational and social network measures of team leaders and team performance), while the leader comparison approach enabled us to compare the characteristics of the team leaders of high and low performing teams. We also compared the characteristics of team leaders leading work and project teams.

Figure 6.1: Research model for data analysis in the advice and socialising network of team leaders

Demographic and organisational measures   **Social network measures**

Gender
Age
Education
Organizational tenure
Team tenure
Professional background

Centrality
Strength of ties
Simmelian ties
Multiplexity
Ties to other teams
Ties to other leaders

Team performance
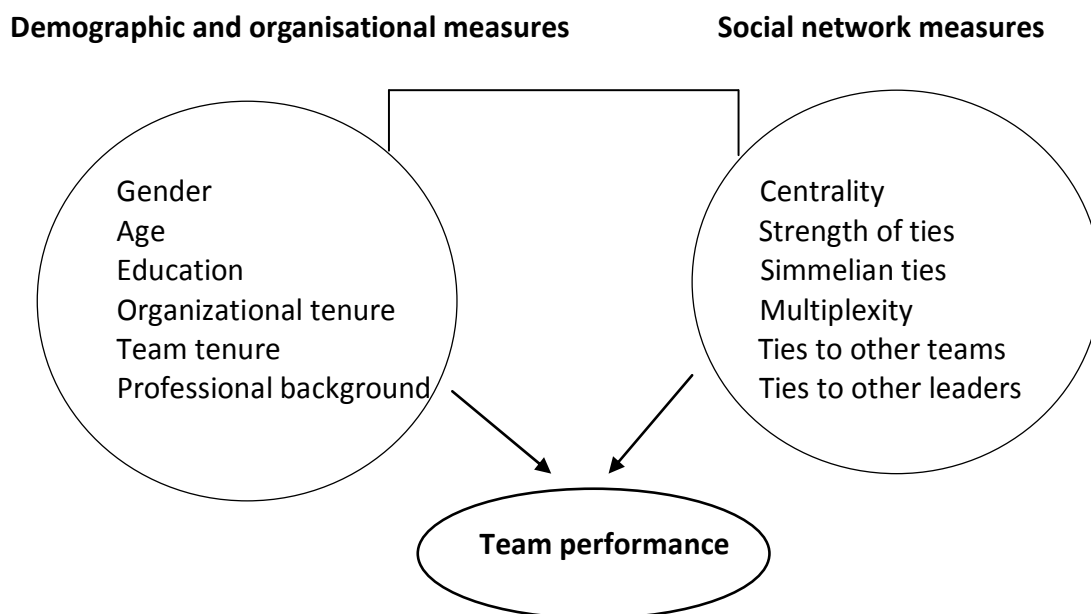
6.1 Slovenian team leaders

We included 26 Slovenian teams from the public (3) and private sector (23) in the research, with 12 teams being classified as work teams and 14 teams as project teams. In this chapter we are interested in the social networks (advice and socialising network) of the Slovenian team leaders. Satisfaction with working in the present team is very high (95.8 percent) among the team leaders.

Basic characteristics of the Slovenian team leaders

The 26 Slovenian team leaders included in the research (Table 6.1.) include 3 women and 23 men. The majority of the Slovenian team leaders (61.5 percent) are aged between 40–55 years and 31 percent of the leaders are younger than 40 years. The majority of the team leaders have a university degree (65 percent) or a master's and PhD (27 percent).

Table 6.1: Demographic characteristics of the Slovenian team leaders

		Frequency	Valid Percent
Gender	Men	23	88.5
	Women	3	11.5
Age			
	25-40 years	8	30.8
	40-55 years	16	61.5
	more than 55 years	2	7.7
Education			
	Elementary, vocational and high school	2	7.7
	University degree	17	65.4
	Master's and Ph.D.	7	26.9
	Total	26	100.0

The leaders of the Slovenian teams have very diverse organisational and team tenure that varies from 1 year to 27 years. Team leaders had on average worked for their organisations for 13 years and had been members of their teams for 7 years. Only one-third of the team leaders (0.27, SD= .452) have a diverse professional background (Table 6.2).

Table 6.2: Organisational characteristics of the Slovenian team leaders

	N	Minimum	Maximum	Mean	Std. Deviation
Organisational tenure	26	1	27	13.29	8.212
Team tenure	26	1	27.0	7.346	8.0035
Professional background	26	0	1	.27	.452

The data in Tables 6.1 and 6.2 on the demographic and organisational characteristics of the team leaders show that the majority of team leaders are men, between 40–55 years old or younger, with a high education and higher organisational than team tenure. Only one-third of the team leaders came to the present team from another organisation.

6.1.1 Team effectiveness and advice network of the Slovenian team leaders

In this chapter we examine the impact of team leaders' demographic/organisational and advice network characteristics on team performance by applying correlations and a leader comparison approach.

Descriptive characteristics of the advice network of the Slovenian team leaders

The Slovenian team leaders are highly central persons in the team advice network (Table 6.3). Almost all team members ask for advice from their team leader (leader's in-degree centrality is 0.96, SD= .099) and the team leaders also often seek advice from other team members (leader's out-degree centrality is 0.97, SD= .084), but they have low betweenness centrality (0.04, SD= .069) and eigenvector centrality (0.39, SD= .071). The team leaders are connected to other members with strong ties (2.6, SD= .746), and have a moderately low share of Simmelian ties (41.4 ties, SD= 31.3) and multiplex ties (0.46, SD= .293). Team

leaders ask for advice more from members of other teams (6.92 bridging ties, SD= 3.616) than other team leaders (3.40 bridging ties, SD= 2.94).

Table 6.3: Advice network characteristics of the Slovenian team leaders

	N	Minimum	Maximum	Mean	Std. Deviation
Centrality (in-degree)	26	.62	1.00	.9565	.09984
Centrality (betweenness)	26	.00	.32	.0458	.06894
Centrality (out-degree)	26	.62	1.00	.9696	.08459
Eigenvector centrality	26	.269	.525	.39442	.071851
Strength of ties	26	1.2	4.0	2.619	.7463
Simmelian ties	26	2	116	41.38	31.301
Multiplexity	26	.000	1.000	.46200	.293360
Ties to other teams	25	0	10	6.92	3.616
Ties to other leaders	25	0	10	3.40	2.944

Slovenian teams leaders have a prestigious position in the advice network, but they do not often act as an intermediary (bridge) between team members and less than half the leaders are connected to other prestigious team members. Team leaders have strong ties with other team members so members ask leaders for their advice 1–3 times a week. Team leaders have a moderately low share of Simmelian ties and they are therefore less constrained to act independently and make autonomous decisions. The leaders also have a moderate share of multiplex ties, meaning that half of the team leaders consult with those members they also socialise with after work and ask for advice more from members of other teams than other team leaders.

6.1.1.1 Bivariate analysis 1 – correlations

Using correlations (Appendix D.1) we examined which demographic/organisational and advice network characteristics of the Slovenian team leaders are significantly related to team effectiveness.

Table 6.4: Correlations in the advice networks of the Slovenian team leaders

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Gender															
2.Age	.064														
3.Education	.092	.499**													
4.Organisational tenure	-.118	.338	.353												
5.Team tenure	.153	.316	.399*	.610**											
6.Professional background	.052	.093	-.366	-.399*	-.193										
7.Centrality (in-degree)	.160	.075	.005	-.082.	-.114	.172									
8.Centrality (betweenness)	.379	-.035	.247	.239	.385	-.308	-.245								
9.Centrality (out-degree)	.132	-.316	-.249	-.395*	-.399*	.222	.154	.084							
10.Eigenvector centrality	.208	-.293	-.516**	-.476*	-.206	.160	-.067	.187	.316						
11.Strength of ties	.019	-.015	-.171	-.531**	-.434*	.175	.495*	-.454*	.213	.404*					
12.Simmelian ties	-.212	.218	.408*	.609**	.294	-.242	-.112	-.155	-.319	-.829**	-.455*				
13.Multiplexity	.164	-.026	-.040	-.131	.032	.326	.337	.074	.213	-.070	.123	-.082			
14.Ties to other teams	-.200	-.246	-.181	-.165	-.155	-.187	.296	-.124	.299	.011	.108	.057	.028		
15.Ties to other team leaders	.077	-.005	.087	-.105	.108	-.056	.357	-.257	.297	-.152	.162	.032	-.016	.610**	
16.Team effectiveness (analysis 1)	-.149	.031	-.347	.115	-.067	.040	.046	-.216	-.116	.018	.070	-.159	.063	-.022	-.117
17.Team effectiveness (analysis 2)	-.132	-.019	-.412*	-.040	-.298	.244	.207	-.327	.120	.044	.213	-.212	-.086	-.056	-.128

*Correlation is significant at the 0.1 level, ** Correlation is significant at the 0.01 level

Table 6.4 shows the correlations of demographic/organisational measures (gender, age, education, organisational tenure, team tenure and professional background) and advice network measures of the Slovenian team leaders (centrality, strength of ties, Simmelian ties, multiplexity and ties to other teams and ties to other leaders) and effectiveness of the Slovenian teams we included in the bivariate analysis.

Relationship between advice networks and the demographic/organisational characteristics of the Slovenian team leaders

Most advice network characteristics of the team leaders are significantly correlated and significantly related to demographic/organisational characteristics (Appendix D).

Leaders' in-degree centrality and eigenvector centrality are significantly positively related to leaders' strength of ties, meaning that team members more often (daily, weekly) ask for advice from leaders who enjoy higher prestige (R= 0.495, p= .010) and leaders who are themselves connected to other powerful persons (R= 0.404, p= .041). It is interesting to note that the frequency of cooperation (strength of ties) with the team leader decreases along with the length of team tenure (R= -0.434, p= .027) or organisational tenure (R= -0.531, p= .005). Leaders' betweenness centrality positively correlates with gender (R= 0.379, p= .056), so women leaders more often than men act as an intermediary in their advice network.

Team leaders who ask for advice more from their team members (out-degree centrality) have been working for their organisation (R= -0.395, p= .046) or leading their teams (R= -0.399, p= .043) for a short time. Lower organisational tenure (R= -0.476, p= .014 and lower education (R= -0.516, p= .007) are also possessed by leaders who are well connected to central others (eigenvector centrality). Leaders who are more embedded in Simmelian ties have been working for their organisations for a longer time (R= 0.609, p= .001) but are less connected to central others (R= -0.829, p= .000) and team members less often turn to them for advice (R= -0.455, p= .020). It is interesting to note that team leaders' satisfaction with the team significantly increases along with the number of leaders' Simmelian ties (R= 0.527, p= .008).

Leaders with ties to other teams also have ties to other team leaders (R= 0.610, p= .001) and leaders who are more prestigious also have a high share of multiplex ties, meaning they consult a lot with people they also socialise with, although this is not significant (R= 0.337, p= .092). Leaders coming to the team from other organisations (diverse professional background) have worked for the company for a shorter time (R= -0.399, p= .044).

Team leaders' centrality in the advice network has no impact on team performance, but positively and significantly correlates to the strength of ties and negatively significantly to education, organisational tenure, team tenure and Simmelian ties. Leaders' betweenness centrality also correlates positively with gender. Leaders' organisational tenure positively and significantly correlates with Simmelian ties and negatively with their professional background. Leaders' bridging ties to other teams positively and significantly correlate with ties to other leaders.

Relationship between the advice network and demographic/organisational characteristics of the Slovenian team leaders and team performance

The demographic/organisational and advice network characteristics of the Slovenian team leaders, except for education, have no significant influence on team performance. The reason probably lies in the small sample size. The education of team leaders (R= -0.412, p=

.037) significantly negatively correlates with team performance, which means that team leaders with higher education lead less successful teams.

6.1.1.2 Bivariate analysis 2 – a leader comparison approach

In this chapter, we compare the demographic/organisational and advice network characteristics of the Slovenian team leaders of the high and low performing teams. We grouped leaders in the same way as in the case of Slovenian teams in two (analysis 1) and three groups (analysis 2), depending on the performance of their teams (Chapter 3.6). By applying a leader comparison approach, we compared the characteristics of the team leaders leading more and less effective Slovenian teams (analysis 1) and the team leaders leading the least and most effective Slovenian teams (analysis 2). The more and most effective teams are defined as high performing teams and the less and least effective teams as low performing teams.

Basic characteristics of Slovenian team leaders of the high and low performing teams

The team leaders of high and low performing Slovenian teams (Appendix D.2 and Appendix D.3) are men, aged 40–55 years. The leaders of high performing teams hold a university degree, while the leaders of low performing teams have a master's degree or PhD. The leaders of more effective teams came to their team from another organisation, have a longer organisational tenure (14.1 years vs. 12.3 years) and a shorter team tenure (6.9 years vs. 7.9 years), so they have been working for their organisations for a longer time and spent less time with their teams than the leaders of less effective teams. The leaders of the most effective teams also came to their team from another organisation, but have a shorter organisational tenure (13.3 years vs. 14 years) and team tenure (4.2 years vs. 10 years) compared to the leaders of the least effective teams.

The leaders better evaluated their team's effectiveness than other team members in the high and in the low performing teams. Regarding the level of self-management, the leaders of low performing teams evaluate their teams as less autonomous than other members,

while in high performing teams, the leaders evaluate their teams as more autonomous than other team members. The leaders of high performing teams lead more autonomous[28] work teams compared to the leaders of low performing teams. The leaders of all teams are satisfied with their teams.

Descriptive characteristics of the advice network of Slovenian team leaders of the high and low performing teams

The leaders of more and less effective Slovenian teams have a highly prestigious position in their advice network. Almost all team members ask for advice from their team leaders (the leader's in-degree centrality is 0.96 and 0.95) and team leaders also often seek advice from other team members (the leader's out-degree centrality is 0.96 and 0.98). The leaders of less effective teams more often act as an intermediary (betweenness centrality) and give advice to members who are not themselves connected (0.06 vs. 0.03), while the leaders of more effective teams have a higher eigenvector centrality degree (0.396 vs. 0.393), so they ask for advice from those members who are also more central in the team. Team leaders have strong advice ties with other members in the team (the strength of ties in the less and more effective teams is 2.6 and 2.7) and consult them 1 to 3 times a week. The team leaders of more effective teams have less Simmelian ties (37 ties vs. 47 ties) so they are less embedded in the teams' advice network structure and higher degree of multiplex ties (0.482 vs. 0.446), where leaders consult with those team members they also socialise with. The leaders of more and less effective teams have equal number of bridging advice ties to other teams (7 ties vs. 7 ties) and lower number of advice ties to other team leaders (3 ties vs. 4 ties) (Appendix D.4).

The leaders of the least and most effective Slovenian teams both hold a prestigious position in the advice network, but the leaders of the most effective teams are more central in their teams than the leaders of the least effective teams (in-degree centrality is 0.99 vs. 0.94; out-degree centrality is 1.00 vs. 0.97; eigenvector centrality is 0.395 vs. 0.388). Leaders of the

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[28] Evaluation of all team members

most effective teams are more often asked for advice by their team members and also leaders ask for advice more from members of their team. The leaders of the most effective teams also have more advice ties to other central team members. Leaders of the most effective teams are less central only regarding betweenness centrality (0.03 vs. 0.08), which means they less often act as a bridge between team members who have no advice ties between each other. The leaders of the most effective teams have stronger advice ties with their team members (2.7 vs. 2.3), meaning they give advice to team members 1 to 3 times per week, while the leaders of the least effective teams consult their team members 1 to 3 times per month. Leaders of the most effective teams have fewer Simmelian ties (33 ties vs. 49 ties) and lower multiplexity than leaders of the least effective teams (0.479 vs. 534), so they are less structurally constrained and consult less with people they also socialise with. The leaders of the most and least effective teams do not differ regarding their bridging ties to other teams (6 ties vs. 6 ties), but the leaders of the most effective teams have fewer bridging ties to other team leaders than the leaders of the least effective teams (3 ties vs. 4 ties) (Appendix D.5).

Figure 6.2: Centrality of a team leader in the advice network of Slovenian team B

Figure 6.2 shows an example of a formal leader of a successful Slovenian team holding a prestigious position (the largest point) in the team's advice network structure.

The results of the leader comparison approach regarding the characteristics of the team leaders of high and low performing Slovenian teams indicate that team leaders do not differ regarding demographic characteristics, such as gender or age, but they differ regarding level of education, organisational and team tenure, a diverse professional background and advice network characteristic (Figure 6.3).

Figure 6.3: Demographic/organisational and advice network characteristics of the Slovenian team leaders with an influence on team performance

Figure 6.3 shows the results of the bivariate analysis on the impact of the demographic/organisational and advice network characteristics of the Slovenian team leaders on team performance. The results indicate that the educational level of team leaders significantly and negatively influences team performance[29], while the success of the Slovenian teams also depends on the team leaders` centrality, strength of ties leaders have with other team members, number of Simmelian and multiplex ties and number of ties to other team leaders. Figure 6.3 also shows that the organisational and advice network characteristics of the Slovenian team leaders significantly correlate between each other.

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[29] Analysis 2; *Correlation is significant at the 0.01 level, ** correlation is significant at the 0.05 level

The leaders of high performing Slovenian teams are mostly men, aged 40–55 years, hold a university degree and have a diverse professional background, as well as a longer organisational and shorter team tenure. The leaders of high performing teams have in the advice network more prestigious position and stronger advice ties to other team members than the leaders of low performing teams. Leaders of high performing teams are also less embedded in the team network structure with their Simmelian ties and have fewer multiplex ties and fewer bridging ties to other team leaders compared to the leaders of low performing teams. The leaders of high performing teams lead more autonomous work teams compared to the leaders of low performing teams.

6.1.2 Team effectiveness and socialising network of Slovenian team leaders

In this chapter we examine the impact of team leaders' demographic/organisational and socializing network characteristics on team performance by applying correlations and a leader comparison approach.

Descriptive characteristics of the socialising network of the Slovenian team leaders

The Slovenian team leaders have a moderate centrality degree (0.52, SD= .326) in their teams' socialising network. Leaders are not the most important person in the team to socialise with, they rarely socialise with members who do not socialise among each other (betweenness centrality is 0.06, SD= .119), but more often socialise with other central team members (leaders' eigenvector centrality is 0.30, SD= .132). Leaders have weak socialising ties to other team members. The average strength of the socialising ties between team leaders and team members is 0.7 (SD= .583), indicating that leaders socialise with team members less than once a month. Team leaders also have a low share of Simmelian ties (9.08 ties, SD= 13.1) so leaders are less embedded in the socialising network than they are constrained in the advice network (41.4 Simmelian ties, SD= 31.3). The Slovenian team leaders socialise more with members of other teams (2.52 bridging ties, SD= 3.190) than with other team leaders (1.08 bridging ties, SD= 1.73) (Table 6.5).

Table 6.5: Socialising network characteristics of the Slovenian team leaders

	N	Minimum	Maximum	Mean	Std. Deviation
Centrality (all-degree)	26	.00	1.00	.5258	.32639
Centrality (betweenness)	26	.00	.51	.0577	.11988
Eigenvector centrality	26	.000	.525	.30400	.132351
Strength of ties	26	.0	3.0	.654	.5832
Simmelian ties	26	0	48	9.08	13.099
Ties to other teams	25	0	10	2.52	3.190
Ties to other leaders	25	0	6	1.08	1.730

The Slovenian team leaders are not the most central person in the team's socialising network, but they socialise mostly with other central team members. Team leaders are connected with other team members with weak socialising ties and have a low share of Simmelian ties and more socialising bridging ties to other teams than to other team leaders.

6.1.2.1 Bivariate analysis 1 – correlations

Using the correlations (Appendix D.1) we examined which demographic/organisational and socialising network characteristics of the Slovenian team leaders are significantly related to team effectiveness.

Table 6.6: Correlations in the socializing networks of the Slovenian team leaders

	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Gender													
2.Age	-.064												
3.Education	.092	.499**											
4.Organisational tenure	-.118	.338	.353										
5.Team tenure	.153	.316	.399*	.610**									
6.Professional background	.052	.093	-.366	-.399*	-.193								
7.Centrality (all-degree)	.084	.059	-.045	-.168	-.051	.428*							
8.Centrality (betweenness)	.345	-.230	-.058	.121	.186	-.158	.257						
9.Eigenvector centrality	.024	-.019	-.014	-.324	-.329	.095	.627**	.151					
10.Strength of ties	.005	.192	-.087	-.215	-.075	.502**	.727**	.007	.302				
11.Simmelian ties	-.105	-.008	-.007	-.210	-.009	.557**	.720**	-.158	.240	.656**			
12.Ties to other teams	.017	-.322	-.025	-.233	-.046	.124	.369	-.107	.179	.200	.422*		
13.Ties to other team leaders	.273	-.197	-.014	-.137	.131	.023	.180	.061	.012	-.025	.013	.732**	
14.Team effectiveness (analysis 1)	-.149	.031	-.374	.115	-.067	.040	.164	-.051	.187	.240	.054	-.122	-.144
15.Team effectiveness (analysis 2)	-.132	-.019	-.412*	-.040	-.298	.244	.069	-.187	.226	.213	.063	-.178	-.313

*Correlation is significant at the 0.1 level, ** Correlation is significant at the 0.01 level

Table 6.6 shows the correlations of demographic/organisational measures (gender, age, education, organisational tenure, team tenure and professional background) and socializing network measures of the Slovenian team leaders (centrality, strength of ties, Simmelian ties and ties to other teams and ties to other leaders) and effectiveness of the Slovenian teams we included in the bivariate analysis.

Relationship between the socialising network and demographic/organisational characteristics of the Slovenian team leaders

Most socialising network characteristics of the team leaders are significantly correlated and significantly related to demographic/organisational characteristics (Appendix D.1).

Leaders who are central in the socialising network (all-degree centrality) also socialise with other central team members (R= 0.627, p= .001), their frequency of socialising with other team members is higher (R= 0.727, p= .000) and they are more constrained by their Simmelian ties (R= 0.720, p= .000). Team members prefer to socialise with central leaders, who socialise with other central members, but leaders are therefore more constrained by the Simmelian ties they have with the team members.

The Simmelian ties of leaders also positively correlate with the strength of ties (R= 0.656, p= .000) and with bridging ties to other teams (R= 0.422, p= .036). Leaders who are more structurally constrained also socialise more with their team members and with members of other teams.

Leaders with a diverse professional background are more central in the team's socialising network (R= 0.428, p= .029), more often spend time with other members after work (R= 0.502, p= .009) and are also more embedded by their Simmelian ties (R= 0.557, p= .003). Leaders who socialise with members of other teams also socialise with other team leaders (R= 0.732, p= .000).

Results of the correlations show that team leaders' centrality in the socialising network is positively and significantly related to eigenvector centrality, tie strength, Simmelian ties and

professional background. Leaders' Simmelian ties positively and significantly correlate with tie strength, leaders' bridging ties and their professional background.

Relationship between the socializing network and demographic/organisational characteristics of the Slovenian team leaders and team performance

The demographic/organisational and socializing network characteristics of the Slovenian team leaders, except for education, have no significant influence on team performance. The reason probably lies in the small sample size. The education of team leaders (R= -0.412, p= .037) significantly negatively correlates with team performance, which means that team leaders with higher education lead low performing teams.

6.1.2.2 Bivariate analysis 2 – a leader comparison approach

In this chapter, we compared the socialising network characteristics of the Slovenian team leaders of the high and low performing teams. We grouped the leaders in the same way as in the case of advice network, in two (analysis 1) and three groups (analysis 2) depending on the performance of their teams (Chapter 3.6). By applying a leader comparison approach we compared the characteristics of the team leaders leading more and less effective Slovenian teams (analysis 1) and team leaders leading the least and most effective Slovenian teams (analysis 2). The more and most effective teams are defined as high performing teams and the less and least effective teams as low performing teams.

Basic characteristics of Slovenian team leaders of the high and low performing teams

The team leaders of high and low performing Slovenian teams (Appendix D.2 and Appendix D.3) are men, aged 40–55 years. The leaders of high performing teams hold a university degree, while the leaders of low performing teams have a master's degree or PhD. The leaders of more effective teams came to their team from another organisation, have a longer organisational tenure (14.1 years vs. 12.3 years) and a shorter team tenure (6.9 years vs. 7.9 years), so they have been working for their organisations for a longer time and spent

less time with their teams than the leaders of less effective teams. The leaders of the most effective teams also came to their team from another organisation, but have a shorter organisational tenure (13.3 years vs. 14 years) and team tenure (4.2 years vs. 10 years) compared to the leaders of the least effective teams. The leaders of high performing teams lead more autonomous work teams compared to the leaders of low performing teams. The leaders of all teams are satisfied with their teams.
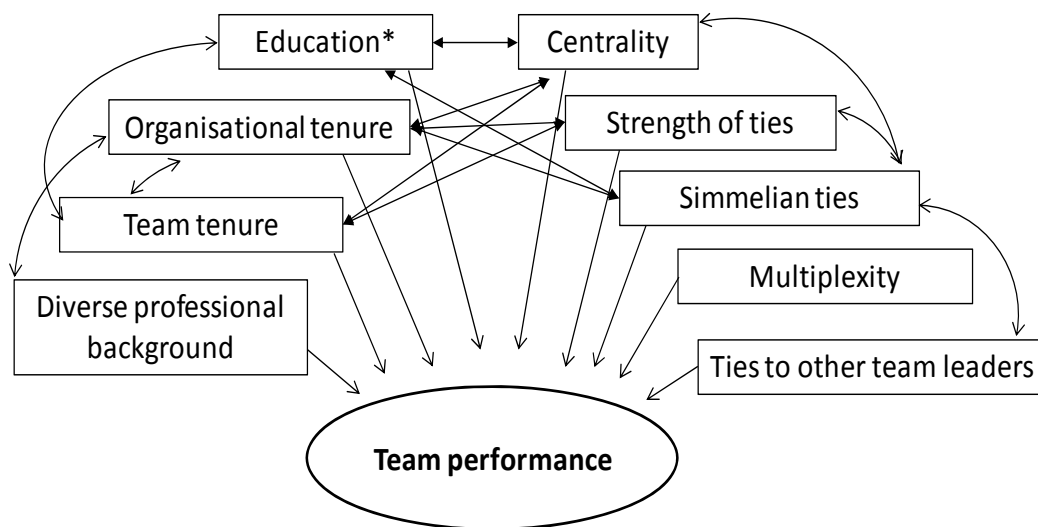
Descriptive characteristics of the socialising network of Slovenian team leaders of the high and low performing teams

The leaders of more effective Slovenian teams have a higher centrality degree (0.57 vs. 0.47) and eigenvector centrality degree (0.326 vs. 0.278) and a lower betweenness centrality degree (0.05 vs. 0.06) in the socialising network. This means that the leaders of more effective teams socialise with more members, including central members, of their teams than the leaders of less effective teams and at the same time socialise less with members who do not socialise with each other. Leaders of less and more effective teams are weakly connected to other members and socialise with them less than once a month (strength of ties is 0.8 vs. 0.5). The team leaders of the more effective teams have more Simmelian ties (10 ties vs. 8 ties) in their socialising network so they are more structurally constrained when they go out after work with other members of their teams. Leaders of more effective teams also have fewer socialising bridging ties to other teams (2 ties vs. 3 ties) and equal socialising bridging ties to other team leaders (1 vs. 1) (Appendix D.6) .

In their teams' socialising networks, the leaders of the most effective Slovenian teams have a more central position (all-degree centrality is 0.63 vs. 0.56) and socialise with other central team members (0.370 vs. 0.294), but less with those members who do not socialise with each other (betweenness centrality is 0.03 vs. 0.08). Leaders of the most and least effective teams have weak socialising ties with their team members (0.9 vs. 0.6), which means they socialise after work less than once a month. Leaders of the most effective teams have more Simmelian ties (13 ties vs. 10 ties) and fewer bridging ties to members of other teams (2 ties vs. 3 ties) and to other leaders (0 ties vs. 2 ties) (Appendix D.7).

The results of the leader comparison approach regarding the characteristics of the team leaders of high and low performing Slovenian teams indicate that team leaders do not differ regarding demographic characteristics, such as gender or age, but they differ regarding level of education, organisational and team tenure, a diverse professional background and socializing network characteristic (Figure 6.4).

Figure 6.4: Demographic/organisational and socializing network characteristics of the Slovenian team leaders with an influence on team performance
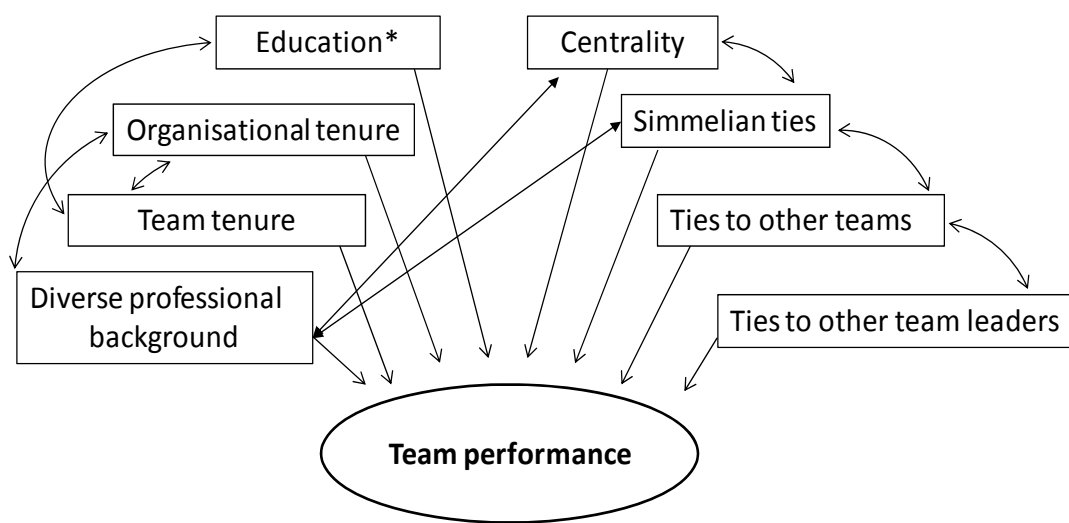
Figure 6.4 shows the results of the bivariate analysis on the impact of the demographic/organisational and socialising network characteristics of the Slovenian team leaders on team performance. The results indicate that education significantly influences team performance[30], while the success of the Slovenian teams also depends on the team leaders` centrality, number of Simmelian ties and number of bridging ties the team leaders have with members and leaders of other teams. Figure 6.4 also shows that the organisational and socializing network characteristics of the Slovenian team leaders significantly correlate between each other.

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[30] Analysis 2; *Correlation is significant at the 0.01 level, ** correlation is significant at the 0.05 level; analysis 2

The leaders of high performing Slovenian teams are mostly men, aged 40–55 years, hold a university degree and have a diverse professional background, as well as a longer organisational and shorter team tenure. The leaders of high performing teams have in the socializing network more prestigious position, but they are also more embedded in the team network structure with their Simmelian ties and have fewer bridging ties to members of other teams and other team leaders compared to the leaders of low performing teams. The leaders of high performing teams lead more autonomous work teams compared to the leaders of low performing teams.

6.1.3 Social network characteristics of the Slovenian work and project team leaders

The results of the correlations in the team leaders' social networks show that team typology (R= -0.426, p= .030) significantly correlates to team effectiveness (Appendices D and D.1). Accordingly, in this chapter we describe in detail the advice and socialising networks of the Slovenian work and project team leaders. Work team leaders lead high performing teams (1.67 vs. 1.43 in analysis 1; 2.33 vs. 1.64 in analysis 2) with a higher level of self-management (4.14 vs. 4.03) compared to the leaders of project teams (Table 6.7).

Table 6.7: Slovenian work team and project team leaders by team effectiveness and level of self-management

	Team typology	N	Mean	Std. Deviation	Std. Error Mean
Team effectiveness (analysis 1)	Work teams	12	1.67	.492	.142
	Project teams	14	1.43	.514	.137
Team effectiveness (analysis 2)	Work teams	12	2.33	.778	.225
	Project teams	14	1.64	.745	.199
Team self-management level	Work teams	12	4.1417	.28584	.08252
	Project teams	14	4.0291	.34036	.09097

The team leaders of work teams lead more effective and more autonomous teams and, since with their behaviour, actions and contacts team leaders strongly influence team members (Homans 1950), we analysed the social networks of the work team and project team leaders.

Descriptive characteristics of the advice network of the Slovenian work team and project team leaders

Team leaders' advice network characteristics that significantly correlate with team typology (Appendix D) are the leaders' eigenvector centrality (R= -0.558, p= .003) and Simmelian ties (R= 0.650, p= .000). Strength of ties, bridging ties to other teams and other leaders and multiplexity are not significantly related to team typology, but we included them in the research as important measures of the team leaders' advice network.

Work team leaders are more connected to other central team members (0.44 vs. 0.36) and less embedded in Simmelian ties than project team leaders (19.8 vs. 59.8). Work team leaders have strong ties with other members of their team and more frequently (weekly) give advice to them than the leaders of project teams (monthly). Work team leaders have a higher multiplexity of ties (0.47 vs. 0.45) and more ties to other teams (7.67 vs. 6.23) and other team leaders (3.5 vs. 3.3) than project team leaders (Table 6.8).

Table 6.8: Advice network characteristics of the Slovenian work team and project team leaders

	Team typology	N	Mean	Std. Deviation	Std. Error Mean
Eigenvector centrality	Work teams	12	.43692	.061642	.017794
	Project teams	14	.35800	.060145	.016074
Strength of ties	Work teams	12	2.885	.6840	.1975
	Project teams	14	2.391	.7442	.1989
Simmelian ties	Work teams	12	19.83	15.266	4.407
	Project teams	14	59.86	29.845	7.977
Multiplexity	Work teams	12	.47458	.335813	.096941
	Project teams	14	.45700	.254490	.068015
Ties to other teams	Work teams	12	7.67	3.114	.899
	Project teams	14	6.23	4.024	1.116
Ties to other leaders	Work teams	12	3.50	2.812	.812
	Project teams	14	3.31	3.172	.880

Leaders of work teams are more central and less structurally constrained by Simmelian ties than the leaders of project teams. The high eigenvector centrality gives work team leaders access to strategic information held by other central people, while higher structural autonomy gives them more freedom to make "at one time abrupt, forceful, centralised and at another time slow relaxed, dispersed" (Homans 1950, 419) decisions in favour of the team as a whole and not in favour of specific team members that through Simmelian ties put pressure on leaders. The leaders of work teams are more strongly connected to other members and have more ties outside the team, with other teams and other team leaders. Leaders of work teams also have more multiplex ties that give these leaders access to a variety of resources.

Descriptive characteristics of the socialising network of the Slovenian work team and project team leaders

Although the team leaders' socialising network characteristics have no significant relationship with team typology (Appendix D.1), we included in the analysis all important social network measures (centrality, strength of ties, Simmelian ties, ties to other teams and ties to other leaders) to compare the characteristics of the work and project team leaders.

The work team leaders also have higher centrality than the project team leaders in the socialising network (Table 6.9). They are a more central person for going out with after work (0.55 vs. 0.50) and they socialise with a higher number of other central team members (0.343) than do the project team leaders (0.269). But when considering the frequency of socialising, the leaders of work and project teams go out after work with their team members less than once a month. The leaders of work teams are also more constrained by their Simmelian socialising ties (10.17) than the project team leaders (8.14), in contrast to their advice network where they are less constrained than the project team leaders. Leaders of work teams have a bigger number of bridging socialising ties than project team leaders. They socialise with more members of other teams (3.58 vs. 1.54) and with more leaders of other teams (1.5 vs. 0.69).

Table 6.9: Socialising network characteristics of the Slovenian work team and project team leaders

	Team typology	N	Mean	Std. Deviation	Std. Error Mean
Centrality (all-degree)	Work teams	12	.5558	.37476	.10818
	Project teams	14	.5000	.29065	.07768
Eigenvector centrality	Work teams	12	.34383	.138797	.040067
	Project teams	14	.26986	.121101	.032366
Strength of ties	Project teams	12	.754	.7936	.2291
	Project teams	14	.569	.3226	.0862
Simmelian ties	Work teams	12	10.17	15.123	4.366
	Project teams	14	8.14	11.595	3.099
Ties to other teams	Work teams	12	3.58	4.100	1.184
	Project teams	14	1.54	1.664	.462
Ties to other leaders	Work teams	12	1.50	2.111	.609
	Project teams	14	.69	1.251	.347

The leaders of the Slovenian work teams have in the socialising network higher centrality than the leaders of the project teams and are more connected to other central members, but they are also more structurally constrained by Simmelian ties. Leaders of work teams have more bridging socialising ties to members of other teams and other team leaders.

6.2   Finnish team leaders

In this chapter we describe the demographic/organisational and social network characteristics of the Finnish team leaders by applying a bivariate analysis such as correlations and a team leader comparison approach. With the correlations we examined the relationship between different groups of measures (demographic/organisational and social network measures of team leaders and team performance), while with the leader comparison approach we compared the characteristics of team leaders of high and low performing teams. We also compared the characteristics of Finnish team leaders leading work and project teams.

Basic characteristics of the Finnish team leaders

We included seven Finnish leaders (Table 6.10) in the research, all of whom are women, with very high level of education (master's degree) and aged between 40–55 years (71 percent) and younger (29 percent).

Table 6.10: Demographic characteristics of the Finnish team leaders

	Frequency	Valid Percent
Gender Women	7	100.0
Age		
25-40 years	2	28.6
40-55 years	5	71.4
Education		
Master's and doctoral degree	7	100.0
Total	7	100.0

The leaders of the Finnish teams have very diverse organisational (from 2 to 12 years) and team tenure (from 0.5 to 5 years). Team leaders have on average worked for their organisations for 8.4 years and led their team for 2.5 years (Table 6.11).

Table 6.11: Organisational characteristics of the Finnish team leaders

	N	Minimum	Maximum	Mean	Std. Deviation
Organisational tenure	7	2.0	12.0	8.429	4.1576
Team tenure	7	.5	5.0	2.571	1.7895
Professional background	7	0	1	.43	.535

All of the Finnish teams included in the research are led by women, the majority of leaders is aged between 40–55 years, and all have a very high education level (master's degree and PhD). The leaders have a higher organisational than team tenure so they have been working longer for the organisation than they have been leading their teams. Satisfaction with working in the present team is very high (100 percent) among the Finnish team leaders.

6.2.1 Team effectiveness and social network of the Finnish team leaders

In this chapter we examine the impact of the team leaders' demographic/organisational and advice network characteristics on team performance by applying correlations and a leader comparison approach.

Descriptive characteristics of the social networks of the Finnish team leaders

The social networks of the Finnish team leaders are somewhat specific, as mentioned in Chapter 4 on the social networks of the Finnish teams. Due to the low response rate of the Finnish team members about their ties to team leaders, we could only completely analyse and interpret the leaders' socialising network, while from the leaders' advice network we only included in the research the leaders' out-degree centrality and leaders' bridging ties (Appendix E.2).

The Finnish team leaders are highly central persons in their teams' advice network and consult with all team members (leaders' out-degree centrality is 0.98, SD= .045), while they only socialise with half of the team members (leaders' all-degree centrality is 0.57, SD= .369). The Finnish team leaders even less often socialise with other central team members (eigenvector centrality is 0.359, SD= .210) and members who do not socialise with each other (betweenness centrality is 0.13, SD= .210). The Finnish team leaders have weak ties with other team members. The average strength of the ties between the leaders and other team members is 2.0 (SD= .882), indicating the members socialise with their team leaders 1 to 3 times a month. Team leaders have in the socialising network a low share of Simmelian ties (6.57 ties, SD= 6.705) so they are less structurally constrained by other members to act independently. Team leaders ask for advice more from members of other teams (5.14 advice ties, SD= 4.140) than other team leaders (2.57 advice ties, SD= 2.440) and socialise more with other team members (2.57 socialising ties, SD= 3.645) than other leaders (1.14 socialising ties, SD= 1.773) (Table 6.12).

Table 6.12: Social network characteristics of the Finnish team leaders

	N	Minimum	Maximum	Mean	Std. Deviation
Centrality out-degree advice network	7	,88	1,00	,9829	,04536
Centrality all-degree socialising network	7	,00	1,00	,5671	,36990
Betweenness centrality	7	,00	,52	,1279	,21043
Eigenvector centrality	7	,00	,54	,3590	,21087
Tie strength	7	1,0	3,4	2,014	,8826
Simmelian ties	7	0	16	6,57	6,705
Ties to others teams – advice ties	7	0	10	5,14	4,140
Ties to others teams – socialising ties	7	0	10	2,57	3,645
Ties to other leaders – advice ties	7	0	7	2,57	2,440
Ties to other leaders – socialising ties	7	0	5	1,14	1,773

The Finnish leaders have a highly central position in the team advice network and consult with all team members, while they socialise with half of the team members. Team leaders and team members are socially connected with weak ties with members socialising with their team leaders 1 to 3 times a month. Team leaders have a low share of Simmelian ties in the socialising network so they are structurally less constrained by other members. Team leaders ask for advice and socialise with more members of other teams than other team leaders.

6.2.1.1 Bivariate analysis 1 – correlations

With correlations (Appendix E) we examined which demographic/organisational and social network characteristics of the Finnish team leaders are significantly related to team effectiveness.

Table 6.13: Correlations in the social networks of the Finnish team leaders

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.Age														
2.Organisational tenure	.070													
3.Team tenure	.123	-.195												
4.Professional background	-.091	-.921**	.398											
5.Centrality (out-degree; advice network)	-.258	.152	-.352	-.471										
6.Centrality (all-degree; socializing network)	-.181	.572	.474	-.381	.080									
7.Centrality (betweenness; socializing network)	-.137	.584	.263	-.539	.247	.450								
8.Eigenvector centrality (socializing network)	-.410	.598	.387	-.325	-.136	.879**	.571							
9.Strength of ties (socializing network)	.127	-.545	-.597	.285	.132	968**	-.500	-.920**						
10.Simmelian ties (socializing network)	.058	.384	.649	-.266	.169	.915**	.424	.658	-.878**					
11.Advice ties to other teams	-.306	-.905**	-.080	.796*	-.091	-.696	-.597	-.603	.683	-.628				
12.Advice ties to other team leaders	-.540	-.784*	.008	.676	.103	-.406	-.504	-.369	.445	-.370	.915**			
13.Socializing ties to other teams	-.736	-.415	.299	.538	-.173	.152	-.255	.282	-.169	.025	.546	.763*		
14.Socializing ties to other team leaders	-.716	-.417	.233	.452	.036	.125	-.283	.169	-.092	.048	.564	.826*	.965**	
15.Team effectiveness	-.730	-.546	-.212	.417	.354	-.313	-.065	-.157	.373	-.359	.645	.676	.452	.452

*Correlation is significant at the 0.1 level, ** Correlation is significant at the 0.01 level

Table 6.13 shows the correlations of demographic[31]/organisational measures (age, organisational tenure, team tenure and professional background) and social network measures of the Finnish team leaders (centrality in the advice and socializing network, strength of ties and Simmelian ties in the socializing network and advice and socializing ties to other teams and to other leaders) and effectiveness of the Finnish teams we included in the bivariate analysis.

Relationship between the social network and demographic/organisational characteristics of the Finnish team leaders

The leaders' advice out-degree centrality shows no significant correlation to the leaders' demographic/organisational characteristics, leaders' social networks or team effectiveness, while leaders' advice bridging ties are significantly related to their social networks. Leaders who are new to their organisations (low organisational tenure) have a diverse professional background (R= -0.921, p= .003) and ask for advice from members of other teams (R= -0.905, p= .005) and leaders of other teams (R= -0.784, p= .037). Finnish leaders who ask for advice from leaders of other teams also ask for advice from members of other teams (R= 0.915, p= .004) and socialise with members of other teams (R= 0.763, p= .046) and with other leaders

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[31] Gender and education are both constant variables

(R= 0.826, p= .022). Bridging advice ties to members of other teams are held by leaders with a diverse professional background (R= 0.796, p= .032).

The more central Finnish team leaders are, the less often they socialise with other team members (R= -0.968, p= .000), while the more they socialise with other central team members (eigenvector), the less they socialise with other team members (R= -0.920, p= .003). The more often team leaders socialise with other members the less they are embedded in Simmelian ties (R= -0.878, p= .009). It is not the intensity of socialising (tie strength) that constrains the team leaders, but their central position that positively correlates with Simmelian ties (R= 0.915, p= .004). The Finnish team leaders who socialise with members of other teams also socialise with other team leaders (R= 0.965, p= .000).

The analysis of the leaders' socialising networks shows that the frequency of socialising (tie strength) between the Finnish team leaders and other team members significantly and negatively correlates with the leaders' centrality and with Simmelian ties; leaders' centrality positively and significantly correlates with leaders' Simmelian ties and leaders' socialising bridging ties to other teams and other leaders also significantly and positively correlate.

Relationship between the demographic/organisational and social networks of the Finnish team leaders and team performance

The age of the team leaders (R= -0.730, p= .062) and the leaders' bridging advice ties to other leaders (R= 0.576, p= .096) are the only two characteristics of the Finnish team leaders with a significant correlation to team effectiveness. Younger Finnish team leaders and leaders who consult with other team leaders lead more effective teams.

6.2.1.2 Bivariate analysis 2 – a leader comparison approach

In this chapter, we compared the demographic/organisational characteristics and social networks of the Finnish team leaders of high and low performing teams. We grouped leaders in two (analysis 1) and three groups (analysis 2), depending on the performance of their teams (Chapter 3.6). By applying a leader comparison approach similarly as for the case

of Slovenian team leaders, we compared the characteristics of team leaders leading more and less effective Finnish teams (analysis 1) and team leaders leading the least and most effective Finnish teams (analysis 2). More effective teams are defined as high performing teams and less effective teams as low performing teams.

Basic characteristics of Finnish team leaders of the high and low performing teams

Team leaders of more and less effective Finnish teams are women, aged 25-40 years (more effective teams) and 40–55 years (less effective teams) and very well-educated, all have a master's degree or a PhD. The leaders of more effective teams have a shorter organisational tenure (6.0 years vs. 10.3 years) and team tenure (2.2 years vs. 2.9 years), so they have been working for their organisations and their teams for less time than the leaders of less effective teams. Leaders of more effective teams have a diverse professional background, while leaders of less effective teams do not come to the team from another organisation (Appendix E.1). The leaders of less effective teams better evaluated their team's effectiveness than other members of the team (3.91 vs. 3.83), while the leaders of more effective teams evaluated their team's effectiveness the same as their team members (4.31). Regarding the level of self-management, the leaders of the less effective teams evaluated their teams as less autonomous than other members (3.42 vs. 3.49), while the leaders of the more effective teams evaluated their teams as more autonomous than other team members (4.00 vs. 3.82). To sum up, the leaders of more effective teams lead more autonomous teams (3.82 vs. 3.49)[32] that have also been defined as project teams, while the leaders of less effective teams lead less autonomous work teams.

Descriptive characteristics of the social networks of Finnish team leaders of the high and low performing teams

The leaders of more and less effective Finnish teams have very high centrality out-degree (1.00 vs. 0.97) in the advice network, indicating that the team leaders consult with all team members. Leaders of more effective teams are less central in the socialising network than

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[32] Evaluation of team members and team leaders

leaders of less effective teams irrespective of whether we are considering all-degree centrality (0.44 vs. 0.66), betweenness centrality (0.11 vs. 0.14) or eigenvector centrality (0.32 vs. 0.39). The leaders of more effective teams socialise more with other team members compared to the leaders of less effective teams, but the strength of ties is still weak (2.4 vs. 1.8) indicating socializing one to three times a month. The leaders of more effective teams are also less structurally constrained with Simmelian ties (4 ties vs. 9 ties). In the case of external, bridging ties, the leaders of more effective teams ask for advice more from members (8 ties vs. 3 ties) and more from the leaders of other teams (4 ties vs. 1 tie) and also socialise with more members (4 ties vs. 1 ties) and more leaders of other teams (2 ties vs. 1 tie) (Appendix E.2).

The results of the leader comparison approach regarding the characteristics of the team leaders of high and low performing Finnish teams indicate that team leaders do not differ regarding demographic characteristics, such as gender or education, but they differ regarding age, organisational and team tenure, a diverse professional background and social network characteristics (Figure 6.5).

Figure 6.5: Demographic/organisational and socializing network characteristics of the Finnish team leaders with an influence on team performance
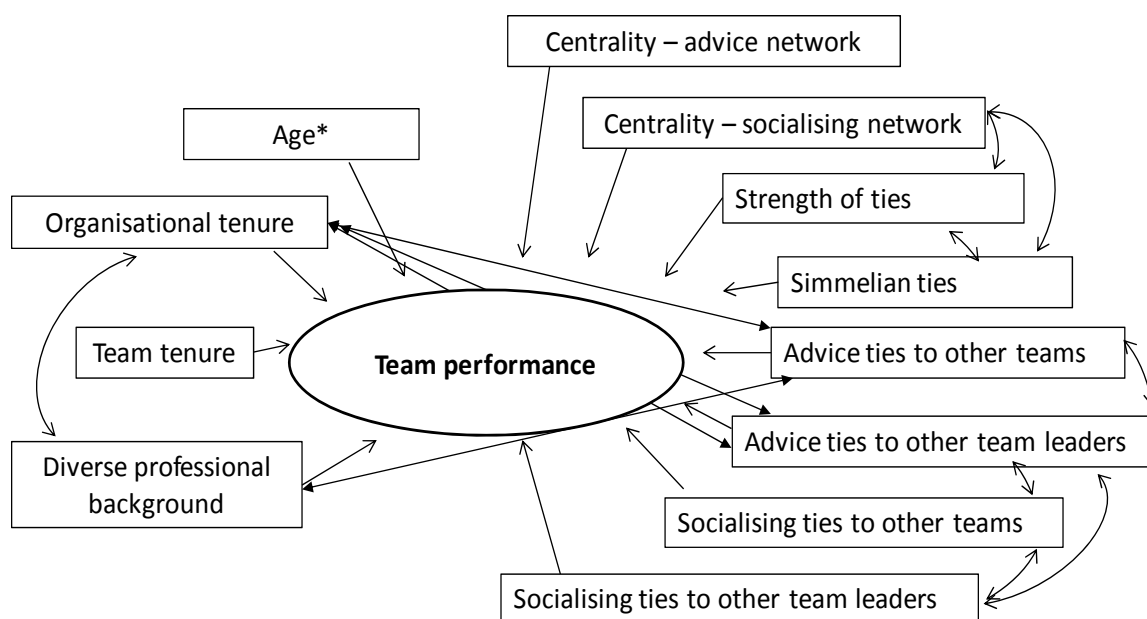
Figure 6.5 shows the results of the bivariate analysis on the impact of the demographic/organisational and socialising network characteristics of the Finnish team leaders on team performance. The results indicate that age significantly influences team performance[33], while the success of the Finnish teams also depends on the team leaders` centrality, strength of ties, number of Simmelian ties and number of advice and socializing ties the team leaders have with members and leaders of other teams. Figure 6.5 also shows that demographic/organisational and social network characteristics of the Finnish team leaders significantly correlate between each other.

The leaders of high performing Finnish teams are women with master`s degree or PhD. When comparing the leaders of the high and low performing Finnish teams, the leaders of more effective teams are younger and have a shorter organisational and team tenure, but a more diverse professional background so more leaders of successful teams come to the organisation from other companies. The leaders of high performing Finnish teams are more central (out-degree) in the advice network, which means they consult with more team members, but in the socialising network they are less central than the leaders of low performing teams. Leaders of high performing teams have stronger, although still weak, socializing ties to other team members and are structurally less constrained with Simmelian ties. Leaders of high performing Finnish teams also have more advice and socialising ties to other teams and other team leaders than leaders of less effective teams. Leaders of high performing teams lead more autonomous teams that have been defined as project teams

6.2.2 Social network characteristics of the Finnish work and project team leaders

The results of the correlations in the team leaders' social networks show that the leaders' centrality (R= -0.777, p=.040), strength of ties (R= 0.833, p=.020) and Simmelian ties (R= -0.824, p=.023) significantly correlate with team typology (Appendices E). Accordingly, in this chapter we describe the social networks of the Finnish work and project team leaders.

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[33] *Correlation is significant at the 0.01 level, ** correlation is significant at the 0.05 level; analysis 2

The Finnish leaders of project teams lead more effective teams than the leaders of work teams (0.67 vs. 0.4), but the Finnish work teams and project teams do not vary regarding their high level of self-management (Table 6.14).

Table 6.14: Finnish work team and project team leaders by team effectiveness and level of self-management

	Team type	N	Mean	Std. Deviation	Std. Error Mean
Team performance (analysis)	Work teams	5	.40	.548	.245
	Project teams	3	.67	.577	.333
Team self-management	Work teams	5	3.6280	.10035	.04488
	Project teams	3	3.6250	.58006	.33490

The Finnish leaders of project teams more often (weekly) socialise with their team members than do leaders of work teams (monthly), but they are not so popular for socialising with after work as are the leaders of work teams. The centrality of the work team leaders is higher (0.79) than the centrality of the project team leaders (0.26), but the leaders of the project teams are less constrained by socialising Simmelian ties (0.67) than the work team leaders (11) (Table 6.15).

Table 6.15: Socialising network characteristics of the Finnish work team and project team leaders

	Team type	N	Mean	Std. Deviation	Std. Error Mean
Centrality (all-degree)	Work teams	4	.7975	.22515	.11257
	Project teams	3	.2600	.29462	.17010
Tie strength	Work teams	4	1.425	.3617	.1809
	Project teams	3	2.800	.7211	.4163
Simmelian ties	Project teams	4	2.800	5.292	2.646
	Project teams	3	.67	1.155	.667

The Finnish leaders of project teams lead more effective teams, have a less central position in the team's network and stronger socialising ties to other team members within the team compared to the leaders of work teams. Leaders of project teams are also less structurally constrained by Simmelian ties.

7   TIE RESOURCES

Resources that flow through informal social ties of teams are as important as the network structure of these ties. Social ties among team members often transmit a variety of resources. In this chapter we describe in more detail the resources that flow through team members' socialising ties in the Slovenian and Finnish teams.

7.1   The Slovenian teams and team leaders

Resources such as social support, trust, political support, information and emotional support are often only assumed to flow through informal social ties (Oh et al. 2004), so we asked the respondents about the type of resources that flow through their socialising ties within and outside their teams. Our results indicate (Table 7.1 and Table 7.2) that in 58 percent of Slovenian teams members socialise with other team members within their team for social support (socialising after work and friendship) and trust (11.5 percent), while with members of other teams they do so for social support (61.5 percent) and information (19 percent).

Table 7.1: Resources that flow through socialising ties within the Slovenian teams

		Frequency	Valid Percent
Valid	Information	2	7.7
	social support	15	57.7
	social support, information	1	3.8
	social support, trust	1	3.8
	Trust	3	11.5
	trust, information	2	7.7
	trust, social support	2	7.7
	Total	26	100.0

Table 7.2: Resources that flow through socialising ties outside Slovenian teams

		Frequency	Valid Percent
Valid	information	5	19.2
	social support	16	61.5
	social support, information	1	3.8
	social support, trust	1	3.8
	trust	2	7.7
	trust, emotional support	1	3.8
	Total	26	100.0

Less and more effective Slovenian teams do not differ much regarding the resources that flow through their socialising ties. The most important resource that flows through the internal and external members' social ties is social support. Members of less effective teams (Table 7.3) exchange mostly social support (58 percent) and information (17 percent) within the team, while members of more effective teams exchange a variety of resources like social support (57 percent), trust (14 percent), trust and information (14 percent) and trust and social support (14 percent). Through bridging ties outside the team, members of less effective teams mainly exchange social support (50 percent) and information (42 percent), while members of more effective teams socialise for social support (71 percent) and trust (14 percent).

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Table 7.3: Resources that flow through socialising ties of less and more effective Slovenian teams

		Analysis 1	
		Less effective teams	More effective teams
Resources within the team	information	2 (16.7%)	0
	social support	7 (58.4%)	8 (57.1%)
	social support, information	1 (8.3%)	0
	social support, trust	1 (8.3%)	0
	trust	1 (8.3%)	2 (14.3%)
	trust, information	0	2 (14.3%)
	trust, social support	0	2 (14.3%)
Resources outside the team	information	5 (41.7%)	0
	social support	6 (50.0%)	10 (71.4%)
	social support, information	1 (8.3%)	0
	social support, trust	0	1 (7.14%)
	trust	0	2 (14.3%)
	trust, emotional support	0	1 (7.14%)

Social support is also the most important resource that flows through socialising ties in the least effective (68 percent), medium effective (56 percent) and most effective teams (50 percent, Table 7.4). The second most important resource exchanged among members of the least effective teams is information (22 percent), in medium effective teams it is trust (22 percent) and in the most effective teams it is trust and information (25 percent). Members of all teams mostly exchange through their bridging ties social support (56 percent in the least effective teams; 78 percent in the medium effective teams and 50 percent in the most effective teams). The second most important resource transmitted through the bridging ties of the least effective (33 percent) and medium effective teams (22 percent) is information, while members of the most effective teams exchange a variety of resources like trust (25 percent), trust and emotional support (12.5 percent) and trust and social support (12.5 percent).

Table 7.4: Resources that flow through socializing ties of the least, medium and most effective Slovenian teams

		Analysis 2		
		Least effective teams	Medium effective teams	Most effective teams
Resources within the team	Information	2 (22.2%)	0	0
	social support	6 (67.7%)	5 (55.6%)	4 (50.0%)
	social support, information	0	1 (11.1%)	0
	social support, trust	1 (11.1%)	0	0
	Trust	0	2 (22.2%)	1 (12.5%)
	trust, information	0	0	2 (25.0%)
	trust, social support	0	1 (11.1%)	1 (12.5%)
Resources outside the team	Information	3 (33.3%)	2 (22.2%)	0
	social support	5 (55.6%)	7 (77.7%)	4 (50.0%)
	social support, information	1 (11.1%)	0	0
	social support, trust	0	0	1 (12.5%)
	Trust	0	0	2 (25.0%)
	trust, emotional support	0	0	1 (12.5%)

Members of more effective teams receive information (57 percent) from team leaders, some team members receive information and political support (14.3 percent), information and trust (14.3 percent), information and social support (7.2 percent), and trust and political support (14.3 percent). Members of less effective teams chiefly receive information (83.4 percent) from team leaders, a few team members receive information, trust and political support (8.3 percent) and other members receive trust and political support from their leaders (8.3 percent, Table 7.5).

Table 7.5: Resources that flow through socializing ties of the team leaders of less and more effective Slovenian teams

| | | Analysis 1 | |
		Leaders of less effective teams	Leaders of more effective teams
Resources within the team	Information	10 (83.4%)	8 (57%)
	information, political support	0	2 (14.3%)
	information, social support	0	1 (7.14%)
	information, trust	0	2 (14.3%)
	information, trust, political support	1 (8.3%)	0
	trust, political support	1 (8.3%)	1 (7.14%)

Table 7.6: Resources that flow through socializing ties of the team leaders of the least, medium and most effective Slovenian teams

| | | Analysis 2 | | |
		Leaders of least effective teams	Leaders of medium effective teams	Leaders of most effective teams
Resources within the team	Information	7 (77.8%)	9 (100.0%)	2 (25.0%)
	information, political support	0	0	2 (25.0%)
	information, social support	0	0	1 (12.5%)
	information, trust	0	0	2 (25.0%)
	information, trust, political support	1 (11.1%)	0	0
	trust, political support	1 (11.1%)	0	1 (12.5%)

Members of the most effective teams receive a variety of different resources (Table 7.6) from their leaders, ranging from information (25 percent), information and political support (25 percent), information and trust (25 percent), to information and social support (12.5 percent) and trust and political support (12.5 percent). Members of medium effective teams

only receive information (100 percent) from their team leaders, while members of the least effective Slovenian teams receive information (77.8 percent) from their leaders, while some team members also receive information, trust, political support (11.1 percent), and trust and political support (11.1 percent).

7.2 The Finnish teams and team leaders

To identify which resources flow through the social ties of the Finnish team members, we asked the respondents, similarly as for the Slovenian teams, why they socialise with other team members inside and outside their team; whether they do it for social support, trust, political support, information, emotional support or some other reason. Our results indicate (Table 7.7 and Table 7.8) that the Finnish team members socialise with members of their team mostly for information (3 teams) and trust (2 teams) and with members of other teams mostly for social support (3 teams).

Table 7.7: Resources that flow through socialising ties within the Finnish teams

		Frequency	Valid Percent
Valid	Information	3	37.5
	political support, information	1	12.5
	social support, information	1	12.5
	social support, political support, information	1	12.5
	Trust	2	25.0
	Total	8	100.0

Table 7.8: Resources that flow through socialising ties outside the Finnish teams

		Frequency	Valid Percent
Valid	Information	1	12.5
	political support	1	12.5
	social support	3	37.5
	social support, emotional support	1	12.5
	social support, political support, information	1	12.5
	trust	1	12.5
	Total	8	100.0

The resources that flow through the socialising ties of less and more effective Finnish teams involve greater differences (Table 7.9).

Table 7.9: Resources that flow through socializing ties of less and more effective Finnish teams

		Analysis	
		Less effective teams	More effective teams
Resources within the team	Information	0	3 (75.0%)
	political support, information	0	1 (25.0%)
	social support, information	1 (25.0%)	0
	social support, political support, information	1 (25.0%)	0
	Trust	2 (50.0%)	0
Resources outside the team	Information	1 (25.0%)	0
	political support	0	1 (25.0%)
	social support	2 (50.0%)	1 (25.0%)
	social support, emotional support	1 (25.0%)	0
	social support, political support, information	0	1 (25.0%)
	Trust	0	1 (25.0%)

The data in Table 7.9 reveal that members of more effective teams socialise inside their teams mostly for information (3 teams) and outside their teams for different reasons like political support (1 team), social support (1 team), or a combination of social support, political support and information (1 team) and trust (1 team). Members of less effective teams socialise with members of their teams mostly for trust (2 teams) and with members of other teams for social support (2 teams).

Members of less and more effective Finnish teams receive a variety of equally important resources from their team leaders (Table 7.10).

Table 7.10: Resources that flow through socializing ties of team leaders of less and more effective Finnish teams

		Analysis	
		Leaders of less effective teams	Leaders of more effective teams
Resources within the team	Information	1 (25%)	2 (66.7%)
	political support, information	0	1 (33.3%)
	trust, information	1 (25%)	0
	trust, political support, information, emotional support	1 (25%)	0
	trust, political support, information	1 (25%)	0

The figures in Table 7.10 show that the team leaders of more effective teams mainly give their team members information (66.7 percent) and a combination of political support and information (33.3 percent), while the leaders of less effective Finnish teams provide their team members with information (25 percent), trust and information (25 percent), trust, political support, information and emotional support (25 percent) as well as trust and political support (25 percent).

The results of our analysis indicate that through their socialising ties members of successful Slovenian teams exchange different resources than members of successful Finnish teams. The team leaders of successful Slovenian teams similarly provide their team members with different resources than the team leaders of successful Finnish teams.

Through their socialising ties, team members of the most effective Slovenian teams exchange within the team mainly social support, trust and information and members of the least effective teams socialise within their teams primarily for social support and information. When members of the most effective Slovenian teams socialise with members of other teams, they exchange a variety of resources like social support, trust, trust and emotional support, trust and social support. Members of the least effective Slovenian teams, on the other hand, exchange mostly social support and information outside their team. Leaders of the most effective Slovenian teams provide their team members with a variety of

support, such as information, political support, trust and social support, while leaders of the least effective Slovenian teams mainly provide their team members with information.

Team members of more effective Finnish teams mostly exchange information through their socialising ties within the team, while members of less effective teams socialise within their team chiefly because of trust. Through their bridging ties with members of other teams members of more effective Finnish teams exchange a variety of resources like political support, social support, trust and a combination of political support, social support and information. Members of less effective Finnish teams, in contrast, socialise outside their teams mostly for social support. Leaders of more effective Finnish teams provide their team members only with information and political support, which seems to be sufficient for the Finnish teams to be successful.

8   FINDINGS

The aim of this doctoral thesis is to identify the factors of successful teamwork by explaining the role social networks play in the dynamics of teams. The main research question is whether different patterns of social networks have a greater impact on the performance of teams than team members' demographic and organisational characteristics. We attempt to give an answer to the research question by testing the research model and the proposed hypotheses H1a, H1b, H2a, H2b, H3, H4a and H4b (Chapter 4-6) by applying bivariate and multivariate analyses. Organisational teams are analysed from three social network perspectives:

1. What particular pattern of advice and socialising network structure makes teams more effective? To answer this question we propose hypotheses H1a and H1b, suggesting that a higher level of cohesion in a team's advice (H1a) and socialising network (H1b) is positively related to the team's performance.

We tested hypotheses H1a and H1b in the case of Slovenian teams in Chapter 4 and applied bivariate and multivariate analyses. Results of the correlations indicate that cohesion, measured as density with valued ties, positively correlates with team performance. Results of the group comparison approach show that high performing Slovenian teams (more and most effective) have a higher level of team cohesiveness in both networks compared to low performing teams (less and least effective teams). But the results of the multivariate regression analysis reveal that cohesion is the most significant predictor of teams` success only in the advice networks of teams that involve a greater contrast regarding their effectiveness (analysis 2). In the case of socialising networks, the influence of size on the performance of teams is stronger than the impact of the cohesion. We can therefore only confirm hypothesis H1a. Results of the regression analysis in the advice networks further reveal that the organisational characteristics of teams such as team tenure also positively influence team effectiveness (analysis 2). The most successful Slovenian teams are thus characterised by a higher level of team cohesiveness in the advice networks and by longer team tenure. In the case of the Finnish teams, we tested hypothesis H1b in Chapter 5 by

conducting a bivariate analysis. Results of the correlations show no significant impact of cohesion on team performance, but the group comparison approach reveals that the high performing Finnish teams have a less cohesive and more centralised socialising network structure compared to the low performing teams. Hypothesis H1b cannot be confirmed for the Finnish teams.

Hypotheses H2a and H2b suggest that a lower centralisation degree in a team's advice and socialising network is positively related to the team's performance. Results of the correlations of the Slovenian teams show that centralisation significantly and negatively correlates with team performance, while the group comparison approach indicates that high performing teams have a low centralisation degree in both networks. However, the results of the multivariate regression analysis in the advice networks reveal that when we control for the teams' demographic and organisational characteristics the influence of centralisation on team performance becomes insignificant. In the case of socialising networks, centralisation has no significant impact on team performance. The influence of team size is stronger than the influence of the centralisation. In the case of socializing networks, the centralisation shows no significant impact on the success of teams. Hypotheses H2a and H2b therefore cannot be confirmed for the Slovenian teams. In the case of the Finnish teams, the correlations show no significant impact of centralisation on team performance, although the group comparison approach reveals that the high performing teams are more centralised. Hypothesis H2b cannot be confirmed for the Finnish teams.

2. The second network perspective focuses on whether effective teams are characterised by greater network diversity, so we propose hypothesis H3 where we assume that teams of a larger network size and with members who have contacts outside the team, with other teams and other team leaders are more successful.

Results of the correlations in the case of the Slovenian teams show that size has a significant negative impact on team effectiveness, while ties to other teams and other leaders have no significant influence. However, the group comparison approach shows that high performing Slovenian teams are small in size and have more bridging ties to other team leaders compared to low performing teams. The results of the multivariate analysis similarly indicate

that size has a significant negative impact on team performance in both networks, while we had to exclude bridging advice ties to other teams from the multivariate analysis because of the strong correlation with size. We can therefore partly confirm hypothesis H3. Successful Slovenian teams are characterised by greater network diversity regarding their bridging advice ties to other team leaders and socializing ties to other teams and team leaders. In the case of the Finnish teams, the correlations show a positive influence of ties to other teams on team performance, while the group comparison approach similarly indicates that high performing Finnish teams have more bridging socialising ties to other teams and team leaders. We can thus partly confirm hypothesis H3 that successful Finnish teams have greater network diversity regarding ties outside their teams.

3. The third network perspective highlights the influence of team leaders' network position on the performance of their teams. How do the social networks of leaders of high and low performing teams vary according to the type of tie? Hypotheses H4a and H4b propose that a prestigious or central position of team leaders in the team advice and socialising network positively contributes to the success of teams.

Results of the correlations regarding the central position of the Slovenian and Finnish team leaders show no significant relationship with team performance. Yet the results of the leader comparison approach reveal that the leaders of high performing Slovenian teams are more prestigious in both networks compared to the leaders of low performing teams. We can therefore confirm hypotheses H4a and H4b for the Slovenian team leaders. A prestigious team leader is a characteristic of high performing Slovenian teams. In the case of the Finnish team leaders, the leader comparison approach indicates that the team leaders only hold a prestigious position in the team advice network, while they are less central in the team socialising network. Therefore, we can only confirm hypothesis H4a.

The main findings of our research highlight the important role the social networks of teams and team leaders play in the success and dynamics of teams. But the answer to the main research question of whether different patterns of social networks have a greater impact on the performance of teams than team members' demographic and organisational characteristics is no. The results of our research on Slovenian teams indicate that different

patterns of teams' social networks (level of team cohesiveness) are just as significant predictors of a team's performance as the organisational characteristics of the team (team size and team tenure). We found similar results in the research on the Finnish teams, albeit only performed at the bivariate level, namely, that different patterns of teams' social networks (cohesion, centralisation, bridging ties to other teams and other team leaders, leader centrality) as well as the organisational characteristics of the teams (team tenure) play an important role in the success of the teams. The findings on the Slovenian teams further indicate that the specific patterns of social networks (cohesion) seem to have a significant impact on the team's performance only in the advice networks, while in the socialising networks, organisational characteristics (size) more strongly influence a team's performance than the social networks of the teams (cohesion). The success of the Slovenian and Finnish teams also depends on the central position of their team leaders

We conclude our findings with the characteristics of the successful Slovenian and Finnish teams and their team leaders. High performing Slovenian teams are characterised by a small size; members are mostly men, with a high education, aged between 40–55 years and with longer team tenure. The teams have a higher level of cohesiveness and decentralised advice and socialising network structure, a lower share of multiplex ties (advice and socialising ties) and team members who are connected with strong advice ties and weak socialising ties. High performing Slovenian teams have more bridging advice ties to other leaders and more socialising ties to other teams and other team leaders compared to the low performing teams. Inside the team, members of Slovenian teams mostly exchange social support, trust and information and, outside the team, a variety of resources: social support, trust, emotional support. The high performing Finnish teams are characterised by a small size; the majority of members are women, with a high education, aged between 40–55 years and with shorter team tenure. Teams have a less cohesive and more centralised socialising network structure and have more socialising ties to other teams and to other team leaders. Members of the Finnish teams mainly exchange information inside the team, and outside the team a variety of resources: political support, social support, trust and information.

The leaders of high performing Slovenian teams are in the majority men, between 40–55 years and younger, with a university degree, shorter team tenure and a diverse professional background. In the team advice and socialising networks, the leaders hold a more prestigious position, have stronger ties with other members and socialise more with other central team members than the leaders of low performing teams. The leaders of high performing teams have equal number of bridging advice ties to members of other teams and fewer socialising ties to other teams and team leaders, lower share of multiplex ties and are less constrained by advice Simmelian ties and more by socialising Simmelian ties compared to the leaders of low performing teams. The social networks of Slovenian team leaders also differ regarding the nature of team work. Leaders of work teams lead more effective teams with a higher level of self-management and have a more prestigious position, more connections to other central team members and more bridging advice and socialising ties to members of other teams and other team leaders compared to the leaders of project teams. Slovenian team leaders provide other members inside the team with a variety of support; information, political support, trust and social support, while leaders of low performing teams mainly provide their team members with information. The leaders of high performing Finnish teams are in the majority women, between 25–40 years and with a very high education (master's and PhD), shorter team tenure and a diverse professional background. Leaders have higher centrality in the advice network, but in the socialising network they are less central than the leaders of low performing teams. The leaders of high performing teams are structurally less constrained by Simmelian ties and have more advice and socialising ties to other teams and other team leaders than the leaders of low effective teams. When we compare the Finnish leaders of work and project teams, the leaders of project teams have stronger socialising ties to other team members within the team and are less constrained by Simmelian ties, but they also hold a less central position in the team than the leaders of work teams. Finnish team leaders only provide other members inside the team with information and political support.

9   DISCUSSION

Teams play an important role in the success of organisations so various structural configurations of teams began to attract research interest. Nohria and Eccless (1992) and Reagans et al. (2004) suggest that relational patterns mediate the effects of the individual's attributes and that the social networks of team members are a better predictor of a team's success than the members' characteristics. The results of our research reveal the opposite and suggest that for successful teamwork different patterns of teams' and team leaders' social networks are just as important as the organisational characteristics of the teams.

Most of the previous research on the influence of social network ties on group performance (Ancona 1990; Baldwin et al. 1997; Hansen 1999; Brown and Miller 2000; Sparrowe et al. 2001; Balkundi and Harrison 2006), with a few exceptions (Reagans and Zuckerman 2001; Oh et al. 2004), was focused either on the social network ties within groups or on the social network ties connecting groups with other groups or group leaders. Following Oh et al. (2004), in this dissertation we included both social network ties inside the team and social network ties outside the team. The main findings of the doctoral thesis regarding advice networks highlight that connections inside the team (cohesion) and connections outside the team (bridging ties) both have an impact on the team's effectiveness. High performing Slovenian teams are characterised by a high level of cohesion in the advice networks and bridging advice ties to other team leaders and bridging socialising ties to other teams and team leaders (a group comparison approach). Our findings are consistent with the findings of previous network research (Baldwin et al. 1997; Reagans and Zuckerman 2001; Balkundi and Harrison 2006; Henttonen et al. 2010) on the positive relationship between density and team performance. Our findings are also consistent with the findings of Reagans and Zuckerman (2001) and Ziherl et al. (2006) who confirmed the positive influence of boundary-spanning ties on a team's performance. The reason that our results are similar to the previous research could be found in the type of ties that were studied – instrumental ties such as work-related ties, which are simple ties.

Our findings on the density of socialising ties, which are more comprehensive ties, are not consistent with the findings from Oh et al. (2004), who also focused on this specific type of social tie. Oh et al. (2004) found that group effectiveness in the socialising network was the highest at a moderate level of group closure, while we did not find such support in our research. Our findings suggest that the level of cohesion in the socialising networks of the Slovenian and Finnish teams has no significant impact on the team's performance. This can be explained by the complexity of these ties and by the organisational culture. Socialising ties are complex ties and because they extend outside the workplace they are difficult to maintain. Slovenian and Finnish organisations have also not established norms for socialising after work, like some Asian cultures, where Oh and co-workers carried out their research. In the Slovenian and Finnish organisations, the employees are not expected to associate with each other outside the workplace. Weak socialising ties and a low level of team cohesiveness in the team's socialising networks seem to be sufficient for the Slovenian and Finnish teams to be effective.

Our results on the positive impact of bridging socialising ties to other team leaders on the team's performance are consistent with the results of Oh et al. (2004). In the Finnish teams, socializing ties to other team leaders have a weak, but statistically significant influence on teams` performance, while in the Slovenian teams a positive impact of the bridging socializing ties is indicated in the group comparison approach. But the findings of our research also show that successful Slovenian and Finnish teams also have more socializing ties to members of other teams, while Oh et al. (2004) did not find support for the relationship between the bridging ties to other teams and team performance.

Regarding the research process, we put a lot of energy into the preparations since we carried out the research in two different organisational settings. Selecting the teams and motivating the organisations appeared to be the most challenging aspects. The criteria of team tenure, namely that team members should have been together for at least six months, seemed to help the organisations to decide which teams to include in the research. Slovenian organisations reported that they organised work mostly in project teams which were less stable because the team members worked in several different teams and often

changed team membership. In Finland, we had very limited time to carry out the research so we were unable to become more involved in the selection of teams and data collection in the field. All of these different factors influenced our relatively small sample size (26 Slovenian teams and 8 Finnish teams). It was first difficult to draw the attention of organisations and then to motivate the team members to participate in the research because we needed a complete response rate. It seems that although it consisted of a number of questions the survey instrument (the questionnaire) was not problematic. Accordingly, despite our relatively small sample size we managed to obtain a lot of interesting and comprehensive views on the social networks of the teams and team leaders. Our sample of Finnish and Slovenian teams consists of teams from large organisations, with more hierarchical levels compared to small organisations, so the results of our research may be generalised to teams from large organisations. What we could have done better in the research is to have become more involved in the research process and data collection in the Finnish organisations and Finnish teams which had a lower response rate than the Slovenian teams. Social network analysis is a very sensitive research topic so the engagement of the researcher is crucial to the success of related research. The results of the evaluation of team success would also have been more accurate if we had managed to provide an upper-management level evaluation of team performance. Regarding future directions, the research on social networks of teams should entail a comparison of the social network patterns of teams from small and large organisations since most network research, including our own, has focused exclusively on teams from medium or large organisations. The most interesting research topic on the social networks of teams would also involve studying the social networks of different personality types of team members.

10 SCIENTIFIC CONTRIBUTION

Research data on the relevance of social ties in the team context is limited so this dissertation makes a contribution to a wider understanding of the dynamics and success of teams by examining the characteristics of the social relations of team members. Understanding how personal networks are related to team performance has the potential of contributing to a better understanding of how the social networks theory aggregates to the group level. This doctoral dissertation contributes to the small group literature and network theory in several ways:

1. In the research on the social networks of teams we incorporated two different types of informal social ties, advice and socialising ties, to examine the relationship between team cohesion and team performance in two different social network contexts.

The advantages of adopting a social network perspective include revealing the implications of different types of ties. This dissertation contributes to the research on social networks of teams by upgrading previous studies that focused mostly on one type of informal social tie (Baldwin et al. 1997; Reagans and Zuckerman 2001; Oh et al. 2004; Henttonen et al. 2010), by incorporating two types of social ties in the research, namely single resource advice ties and more comprehensive socialising ties, as suggested by Oh et al. (2004).

One of the most important patterns of a social network structure, density, reflects the intensity of the relationships within a team. Cohesive teams, where members are connected by strong ties and share a higher level of trust and stronger reciprocity norms, are often predicted to be more successful. The results of our research indicate that density is an influential factor affecting team performance in the network of advice ties, while in the socialising networks team density has no significant influence on team performance. Successful Slovenian teams have an above-average level of cohesiveness in the advice network, while the teams' socialising networks are more centralised and less cohesive.

Our findings contribute to a number of previous network research studies on teams (Baldwin et al. 1997; Reagans and Zuckerman 2001; Balkundi and Harrison 2006; Henttonen et al. 2010) that confirm the important role of network density for the success of teams, and highlight the importance of the type of social ties. Our results suggest that a high level of team cohesiveness is more important for successful teamwork when team members are connected by advice ties rather than socialising ties. This contributes to the understanding that the success of a specific social network structure also depends on the type of social tie and that a higher level of cohesiveness does not always contribute to a better performance. When studying the different patterns of social networks, it is therefore important to also consider the types of social ties that social network structures consist of.

2. We examined the type of resources that flow through team members' socialising ties

This dissertation contributes to the research on social networks of teams by developing a more dynamic view of precisely which types of ties convey which kind of resources as proposed by Mehra et al. (2006). The typical sociological approach is to measure only the social ties within and between groups, while resources such as social support and trust are only presumed to flow through these ties (Oh et al. 2004). Wellman (in Nohria and Eccless 1992, 14) stressed that previous research on networks had focused more on a form of network patterns than on their content...like a "Simmelian sensibility that similar patterns of ties may have similar behaviour consequences, no matter what the substantive context is".

In the research we asked the respondents about two types of social tie: advice and socialising ties. Advice ties are a specific type of instrumental tie that convey advice on job-related issues so these social ties are already defined with the resource, advice, which flows through them. Socialising ties are expressive ties that convey different types of resources, from social support to information and job-related advice. Asking respondents more directly about the type of resources that are transmitted through their socialising ties provided us with a better understanding of the importance of socialising ties in the workplace. The results of our research indicate that socialising after work is not a well-established practice in Slovenian organisations. Although team members socialise after work less than once a

month, through their socialising ties inside their team they exchange a variety of resources such as social support, trust, political support, information and emotional support. Social support like friendship relationships and trust seem to be the most important resources that flow through the bonding and bridging socialising ties of high performing Slovenian teams. Theory on teams stresses trust among team members as a basis for successful teamwork. According to Thompson (2004), trust is the expression of confidence in the team relationship, when team members believe that other members will be committed to the team. Trust is built over time through social interactions, presents a key to good communication and makes conflicts easier to resolve. Trust is also affected by emotions and, when trust is broken, it is hard to regain for emotional reasons (Levi 2007). It appears that it is not the intensity of socialising that is important for successful teamwork in the Slovenian teams, but the content of the resources that are exchanged through the team members' socialising ties.

3. We studied a specific type of tie, an informal socialising tie, in a cultural setting (Finland) where socialising outside the workplace is not established as a cultural norm.

Another important scientific contribution of this dissertation relates to the study of the informal socialising tie in a more individualistic cultural environment like Finland, where socialising after work is not an established cultural norm as in other cultures.

Socialising ties are important because they cross outside of the workplace and extend into multiplex ties that transmit a variety of resources and can help team members perform better. »In many Asian cultures norms have developed whereby employees engage in social activities outside of the workplace« (Oh et al. 2004, 870). Our analyses indicate that members of the Finnish teams socialise after work less than once a month. When interviewed, the Finnish team leaders stressed that team members usually do not socialise with each other and, when they do, it is mostly for information. They pointed out that the most important aspect for team members is "to get things done in a team". This was confirmed when we asked the Finnish team members about the types of resources that are transmitted through their socialising ties. Members of the high performing Finnish teams

mostly exchange information inside their teams while outside their teams, with members and leaders of other teams, different resources are exchanged like political support, social support, trust and a combination of political support, social support and information. The most valuable resources that flow through the bonding and bridging ties of the Finnish team members are thus work-related resources.

4. Empirical contribution to leadership theory

Most of the previous research on leadership focused exclusively on leaders and ignored the social relationships they have with other group members and other leaders (Balkundi et al. 2009) and the potential of those relationships in which leaders are embedded to explain the performance of their groups (Yukl 2002). Recently, research interest in the influence of leaders' social network ties on team performance began to increase (Kilduff and Tsai 2003; Balkundi and Harrison 2006; Balkundi and Kilduff 2006; Kratzer et al. 2008), but few network studies (Mehra et al. 2006) focused on leaders' internal and external network ties or his/her structural embeddedness in the team's social structure.

This dissertation contributes to the theory on leadership by enlightening the social relationship aspect of leadership and focusing on the specific configuration of team leaders' social network ties, internal (bonding) and external network ties (bridging ties), and the support leaders provide to members of their teams. We also contribute to a better understanding of a leader's structural position in the team's overall social structure and its implications for the performance of teams. The results of our research indicate that the leaders of the high performing Slovenian teams have a highly prestigious (central) position in the advice network and less often act as brokers between other team members. Team leaders are connected to other team members with bonding (strong) advice ties and have fewer bridging advice ties to other team leaders. Leaders of high and low performing teams do not differ regarding the number of bridging advice ties to members of other teams. In the socialising network, team leaders are not as central as in the advice network, but the leaders of high performing teams still have higher centrality than the leaders of low performing teams and less often act as brokers between other team members. Team leaders of high

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performing teams are connected to other members with weak socialising ties and have fewer bridging socialising ties to members of other teams and other team leaders than the leaders of low performing teams. The results of the research of the Finnish teams indicate that the team leaders of high performing teams have a more central position in the advice network than the leaders of low performing teams, but in the socialising network they are less central and less often act as brokers. Team leaders are connected to other team members with weak socialising ties and have more bridging advice and socialising ties to members of other teams and other team leaders than the leaders of low performing teams.

Our results, although not statistically significant, are consistent with the findings from Balkundi et al. (2009) that leaders who are more prestigious in teams' social networks lead more successful teams, while leaders who act as brokers lead less successful teams. Our findings also indicate that the bridging ties of the Slovenian team leaders are not as important for the performance of their teams as the bridging ties of the Finnish team leaders. The results further suggest that the resources that flow through the team leaders' social ties are as important for the performance of their teams as the structure of the leaders' social network ties. The leaders of high performing Slovenian teams provide their team members with a variety of support, such as information and political support, which contributes to the team's productivity, and trust and social support, which contributes to the team members' cooperation, and good social relations. On the other hand, the leaders of low performing teams provide team members with one type of resource – information – which only contributes to the task performance of the teams. In the Finnish teams, the picture is different. Leaders of high performing teams provide team members only with information and political support, which seems to be sufficient for the Finnish teams to be successful.

Dyadic ties between the team leaders and other team members, inside and outside the team are important, but the leader's social ties are embedded in larger social networks of teams and organisations. Krackhardt (1999) argues that dense networks enhance communication among team members but they also tend to be constraining. In order to understand the leader's role in the team more comprehensively, we describe the leader's structural position

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in the teams' social structure by examining his/her Simmelian ties. As we explained, Simmelian ties are ties embedded in cliques (Krackhard 1999) and leaders who are members of one or more cliques are constrained in their actions and decisions due to the different pressures other members put on them. Leaders who are embedded in numerous cliques must comply with the different values and norms of those cliques. Our results indicate that the leaders of high performing Slovenian teams have a low share of Simmelian ties in the advice network, which means they are less structurally constrained by the connections among other team members. In the socialising network, the leaders of high performing Slovenian teams have an even lower share of Simmelian ties so they are even less constrained by their socialising Simmelian ties than their advice Simmelian ties. Leaders of high performing Finnish teams are similarly less constrained by their Simmelian ties in the teams' socialising networks.

Leaders as social architects (Bennis 1976) have an important role in a team's overall social structure and contribute to the success of teams by developing their personal network ties, managing the social networks of their teams and providing team members with resources that contribute to different qualities of team performance. It seems that a leader of a successful team is able to find the right balance between its bonding ties and structurally constraining Simmelian ties, while holding a prestigious position in the team's informal social networks.

5. Contribution to the methodological implications of the missing data problem

We contribute to the methodology of social network analysis by providing a comprehensive overview of different imputation techniques on how to treat missing data in social networks. One of the greatest limitations of social network analysis, as pointed out by Hatala (2006), is to ensure a complete response rate. In the dissertation work, in some teams we were faced with the problem of a low response rate and, although it is not realistic to expect a complete return from all respondents, missing data represents a serious limitation for network analyses and distorts the results on the social network structure (Stork and Richards 1992). Therefore, the missing data need to be addressed to be able to analyse each team as a

complete social network. This dissertation contributes with a detailed description of the different imputation techniques we used to replace the missing information in directed and undirected networks that differ according to the type of tie.

Most of the previous research on social networks of teams had a very high response rate, more than 80 percent (Sparrowe et al. 2001), with some studies even obtaining a higher response rate of more than 90 percent (Reagans and Zuckerman 2001; Oh et al. 2004; Mehra et al. 2006). Some authors replaced the missing data with the group mean value as is often the case in networks where the direction of ties is not important, while other researchers did not replace the missing data at all because of the high response rate. The majority of the previous network research also focused on one type of social tie and used only one technique to replace the missing data. In our research, we analysed two different social networks – advice network and socialising network – so we had to apply two different techniques, imputation by reconstruction and imputation by reconstruction for directed networks with valued ties. The missing data problem is especially limiting when we analyse directed networks with valued ties, as was the case of the advice network where the majority of ties may not be reciprocated. We therefore give valuable information on how to prepare social network questions and matrixes, including a reverse question on contact data, to obtain all the needed information on respondents' social ties and to be able to reconstruct the missing data as close to reality as possible.

6. Contribution to the improvement of organisational practices

The final purpose of the doctoral dissertation is to contribute to an improvement of organisational practices through a precise analysis of team performance and the success of teamwork. Our research indicates that, along with size and team tenure, different patterns of teams' social networks play an important role in teamwork. In the advice network, the level of cohesiveness is a significant predictor of team effectiveness. Teams where the majority of team members are bonded by strong advice ties and members consult with each other on a daily or weekly basis are better performers. Our analyses further show that the high performing Slovenian teams have a moderate level of cohesiveness in the advice

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network. And when team members socialise after work, teams perform better if they are small in size, with eight members per team on average. Size negatively correlates with cohesion in both networks, so more cohesive teams consist of a smaller number of team members. Group cohesion refers to the interpersonal bonds that hold a group together (Levi 2007) and joining people together to work as a team can thus create a sense of cohesiveness (Guzzo and Dickson 1996). Forming good social relations early in the team's existence enables the team to better solve problems and manage conflicts throughout the team's work (Levi 2007). When team members spend more time together, their opportunities to develop common interests and new ideas increase. But strong group closure can also constrain teams with regard to outside contacts so the information within the team can become redundant (Oh et al. 2004). Too high a level of cohesiveness is detrimental to team performance so teams must also develop bridging ties outside the team to prevent them from becoming over-cohesive. Results of the bivariate analysis (a group comparison approach) in the Finnish and Slovenian teams indicate that bridging ties to other teams and other team leaders positively impact team's performance.

Strategies to create successful teams should thus focus on activities that encourage social interaction within and outside the team. Training in social interaction skills like effective listening and conflict management and training in task skills such as goal setting and job skills improve communication, cohesion and the ability of teams to work successfully (Levi 2007). A leader can also enhance cohesion by promoting more communication among team members, reducing status differences, ensuring that everyone is aware of each other's contribution and creating a climate of pride in a team (Wech et al. 1998). Frequent communication and nurturing of social relationships among team members are the two most important elements of cohesive teams. Social activities with collaborative technologies, such as chat rooms, video conferences and shared knowledge repositories (Adler and Kwon 2002) as well as small socialising events inside the organisation such as "power breakfast" can help teams develop bridging ties outside the team. Krackhardt and Hanson (1993) describe the idea of "power breakfasts" as implemented by a manager of one company to support the development of bridging ties among different teams, on the condition that members were from different departments. Informal socialising early in the morning, where

members and leaders of different teams can meet for a quick coffee, communicate and exchange information and ideas, especially with other team leaders who have access to different resources, is easy to organise and less time and resource consuming than planning sports or other active social events. According to Adler and Kwon (2002), management should pay attention to balancing the investments in internal, bonding social ties and external, bridging social ties.

Our research highlights the importance of social relationships for the success of teamwork. From the management point of view, team success refers to the performance of a task (Levi 2007), but teams must also find a balance between focusing on the task and maintaining social relationships. We can recommend that HRD managers also consider in their strategies to develop teamwork different patterns of teams' social network structures (social ties inside and outside the team), size of the team and team tenure.

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Appendix A: List of the Slovenian and Finnish organisations included in the research

Slovenian Organisations	Number of employees	Business activity	Number of analysed teams	Number of employees from analysed teams
ISKRATEL KRANJ	170	Telecommunications	10	112
FDV	300	Research	3	35
BTC	220	Commerce	1	10
DELO	443	Printing media	1	7
ZAVAROVALNICA MARIBOR	875	Insurance services	1	8
INTEREUROPA	781	Logistics	1	8
TRIMO	547	Construction	2	17
DANFOSS TRATA	320	Energetics	2	16
KIV	79	Energetics	5	27
Finnish organisations				
ALMAMEDIA	1912	Printing media	5	43
LAUREA HYVINKÄÄ	50	Research	3	19

Appendix B: Advice network of Slovenian teams – correlation matrix

Correlations

		Analysis 1	Analysis 2	Gender	Age	Education	Organizational tenure	Team tenure	Density	Density with valued ties	Strength of ties	Centralization (indegree)	Centralization (betweeness)	Eigenvector centralization	Multiplexity	Size	Ties to other teams "others"	Ties to other leaders	Professional background "organizations"	Team typology
Analysis 1	Pearson Correlation	1	1,000**	,040	,031	-,056	,040	,063	,212**	,217**	,217**	-,232**	-,070	-,092	-,102	-,223**	-,109	,045	-,166*	-,215**
	Sig. (2-tailed)		,000	,581	,667	,441	,577	,391	,003	,002	,002	,001	,334	,200	,155	,002	,130	,528	,021	,003
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Analysis 2	Pearson Correlation	1,000**	1	,164	,062	-,173*	,125	,130	,281**	,296**	,296**	-,291**	-,140	-,201*	-,126	-,265**	-,150	,076	-,198*	-,235**
	Sig. (2-tailed)	,000		,064	,485	,049	,158	,148	,001	,001	,001	,001	,112	,021	,152	,002	,086	,386	,023	,007
	N	131	131	128	130	130	129	126	131	131	131	131	131	131	131	131	131	131	131	131
Gender	Pearson Correlation	,040	,164	1	-,060	,057	,095	,228**	,127	,080	-,008	-,011	,067	-,094	,000	-,191**	-,320**	,033	-,106	-,203**
	Sig. (2-tailed)	,581	,064		,412	,436	,193	,002	,079	,273	,913	,876	,356	,198	,998	,008	,000	,648	,144	,005
	N	191	128	191	190	189	189	186	191	191	191	191	191	191	191	191	191	191	191	191
Age	Pearson Correlation	,031	,062	-,060	1	-,146*	,477**	,128	,012	,089	,153*	-,099	-,064	,051	-,040	-,007	,079	-,050	-,011	-,076
	Sig. (2-tailed)	,667	,485	,412		,043	,000	,077	,871	,215	,034	,168	,377	,482	,579	,928	,271	,488	,882	,295
	N	194	130	190	194	192	193	193	194	194	194	194	194	194	194	194	194	194	194	194
Education	Pearson Correlation	-,056	-,173*	,057	-,146*	1	-,127	,001	-,124	-,207**	-,271**	,233**	,170*	,082	,123	,197**	,046	,053	,318**	,291**
	Sig. (2-tailed)	,441	,049	,436	,043		,078	,990	,085	,004	,000	,001	,018	,257	,088	,006	,522	,465	,000	,000
	N	193	130	189	192	193	192	189	193	193	193	193	193	193	193	193	193	193	193	193
Organizational tenure	Pearson Correlation	,040	,125	,095	,477**	-,127	1	,449**	,041	,002	-,006	,002	-,113	-,025	-,166*	,059	,066	,003	-,192**	-,124
	Sig. (2-tailed)	,577	,158	,193	,000	,078		,000	,571	,981	,935	,982	,118	,734	,021	,414	,359	,972	,007	,087
	N	193	129	189	193	192	193	190	193	193	193	193	193	193	193	193	193	193	193	193
Team tenure	Pearson Correlation	,063	,130	,228**	,128	,001	,449**	1	-,011	-,112	-,152*	,072	-,018	,038	-,036	,031	-,093	,105	-,038	,012
	Sig. (2-tailed)	,391	,148	,002	,077	,990	,000		,882	,125	,036	,320	,801	,604	,621	,666	,202	,149	,605	,868
	N	190	126	186	193	189	190	190	190	190	190	190	190	190	190	190	190	190	190	190
Density	Pearson Correlation	,212**	,281**	,127	,012	-,124	,041	-,011	1	,851**	,620**	-,854**	-,658**	-,665**	-,184*	-,733**	-,581**	,498**	-,399**	-,325**
	Sig. (2-tailed)	,003	,001	,079	,871	,085	,571	,882		,000	,000	,000	,000	,000	,010	,000	,000	,000	,000	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Density with valued ties	Pearson Correlation	,217**	,296**	,080	,089	-,207**	,002	-,112	,851**	1	,891**	-,861**	-,617**	-,610**	-,090	-,701**	-,556**	,175*	-,332**	-,361**
	Sig. (2-tailed)	,002	,001	,273	,215	,004	,981	,125	,000		,000	,000	,000	,000	,212	,000	,000	,015	,000	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Strength of ties	Pearson Correlation	,217**	,296**	-,008	,153*	-,271**	-,006	-,152*	,620**	,891**	1	-,796**	-,492**	-,496**	-,078	-,565**	-,394**	-,173*	-,231**	-,392**
	Sig. (2-tailed)	,002	,001	,913	,034	,000	,935	,036	,000	,000		,000	,000	,000	,278	,000	,000	,015	,001	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Centralization (indegree)	Pearson Correlation	-,232**	-,291**	-,011	-,099	,233**	,002	,072	-,854**	-,861**	-,796**	1	,696**	,552**	,232**	,633**	,356**	-,297**	,297**	,394**
	Sig. (2-tailed)	,001	,001	,876	,168	,001	,982	,320	,000	,000	,000		,000	,000	,001	,000	,000	,000	,000	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Centralization (betweeness)	Pearson Correlation	-,070	-,140	,067	-,064	,170*	-,113	-,018	-,658**	-,617**	-,492**	,696**	1	,632**	,426**	,113	,046	-,346**	,277**	,070
	Sig. (2-tailed)	,334	,112	,356	,377	,018	,118	,801	,000	,000	,000	,000		,000	,000	,116	,527	,000	,000	,334
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Eigenvector centralization	Pearson Correlation	-,092	-,201*	-,094	,051	,082	-,025	,038	-,665**	-,610**	-,496**	,552**	,632**	1	,392**	,258**	,303**	-,155*	,220**	,172*
	Sig. (2-tailed)	,200	,021	,198	,482	,257	,734	,604	,000	,000	,000	,000	,000		,000	,000	,000	,031	,002	,016
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Multiplexity	Pearson Correlation	-,102	-,126	,000	-,040	,123	-,166*	-,036	-,184*	-,090	-,078	,232**	,426**	,392**	1	-,169*	-,272**	-,139	,251**	,126
	Sig. (2-tailed)	,155	,152	,998	,579	,088	,021	,621	,010	,212	,278	,001	,000	,000		,018	,000	,053	,000	,078
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Size	Pearson Correlation	-,223**	-,265**	-,191**	-,007	,197**	,059	,031	-,733**	-,701**	-,565**	,633**	,113	,258**	-,169*	1	,831**	-,261**	,310**	,595**
	Sig. (2-tailed)	,002	,002	,008	,928	,006	,414	,666	,000	,000	,000	,000	,116	,000	,018		,000	,000	,000	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Ties to other teams "others"	Pearson Correlation	-,109	-,150	-,320**	,079	,046	,066	-,093	-,581**	-,556**	-,394**	,356**	,046	,303**	-,272**	,831**	1	-,080	,246**	,475**
	Sig. (2-tailed)	,130	,086	,000	,271	,522	,359	,202	,000	,000	,000	,000	,527	,000	,000	,000		,266	,001	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Ties to other leaders	Pearson Correlation	,045	,076	,033	-,050	,053	,003	,105	,498**	,175*	-,173*	-,297**	-,346**	-,155*	-,139	-,261**	-,080	1	-,006	,120
	Sig. (2-tailed)	,528	,386	,648	,488	,465	,972	,149	,000	,015	,015	,000	,000	,031	,053	,000	,266		,936	,094
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Professional background "organizations"	Pearson Correlation	-,166*	-,198*	-,106	-,011	,318**	-,192**	-,038	-,399**	-,332**	-,231**	,297**	,277**	,220**	,251**	,310**	,246**	-,006	1	,495**
	Sig. (2-tailed)	,021	,023	,144	,882	,000	,007	,605	,000	,000	,001	,000	,000	,002	,000	,000	,001	,936		,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195
Team typology	Pearson Correlation	-,215**	-,235**	-,203**	-,076	,291**	-,124	,012	-,325**	-,361**	-,392**	,394**	,070	,172*	,126	,595**	,475**	,120	,495**	1
	Sig. (2-tailed)	,003	,007	,005	,295	,000	,087	,868	,000	,000	,000	,000	,334	,016	,078	,000	,000	,094	,000	
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	195	195	195

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix B.1: Socialising network of Slovenian teams – correlation matrix

Correlations

		Analysis 1	Analysis 2	Gender	Age	Education	Organizational tenure	Team tenure	Density	Density with valued tie	Strength of ties	Centralization (all degree)	Centralization (betweeness)	Eigenvector centralization	Size	Ties to other teams "others"	Ties to other leaders	Professional background "organizations"	Team typology
Analysis 1	Pearson Correlation	1	1,000**	,040	,031	-,056	,040	,063	,172*	,170*	,124	-,016	,079	-,129	-,223**	-,015	,045	-,168*	-,215**
	Sig. (2-tailed)		,000	,581	,667	,441	,577	,391	,016	,018	,084	,825	,270	,072	,002	,833	,531	,019	,003
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Analysis 2	Pearson Correlation	1,000**	1	,164	,062	-,173*	,125	,130	,198*	,221*	,166	-,035	,066	-,177*	-,265**	,022	,081	-,201*	-,231**
	Sig. (2-tailed)	,000		,064	,485	,049	,158	,148	,023	,011	,058	,692	,454	,043	,002	,804	,357	,022	,008
	N	131	131	128	130	130	129	126	131	131	131	131	131	131	131	131	131	130	131
Gender	Pearson Correlation	,040	,164	1	-,060	,057	,095	,228**	,128	,133	,038	,130	,092	-,123	-,191**	-,216**	,168*	-,105	-,204**
	Sig. (2-tailed)	,581	,064		,412	,436	,193	,002	,077	,067	,599	,072	,206	,089	,008	,003	,020	,148	,005
	N	191	128	191	190	189	189	186	191	191	191	191	191	191	191	191	191	190	191
Age	Pearson Correlation	,031	,062	-,060	1	-,146*	,477**	,128	-,029	,020	,004	-,056	-,103	-,036	-,007	-,091	-,100	-,009	-,082
	Sig. (2-tailed)	,667	,485	,412		,043	,000	,077	,685	,780	,956	,436	,153	,618	,928	,207	,163	,901	,258
	N	194	130	190	194	192	193	190	194	194	194	194	194	194	194	194	194	193	194
Education	Pearson Correlation	-,056	-,173*	,057	-,146*	1	-,127	,001	,067	,049	,047	,037	-,059	-,144*	,197**	-,095	-,019	,318**	,292**
	Sig. (2-tailed)	,441	,049	,436	,043		,078	,990	,353	,495	,515	,607	,411	,046	,006	,190	,789	,000	,000
	N	193	130	189	192	193	192	189	193	193	193	193	193	193	193	193	193	192	193
Organizational tenure	Pearson Correlation	,040	,125	,095	,477**	-,127	1	,449**	-,123	-,073	-,088	,078	,054	-,061	,059	,002	,067	-,194**	-,113
	Sig. (2-tailed)	,577	,158	,193	,000	,078		,000	,087	,314	,222	,281	,458	,400	,414	,979	,357	,007	,118
	N	193	129	189	193	192	193	190	193	193	193	193	193	193	193	193	193	192	193
Team tenure	Pearson Correlation	,063	,130	,228**	,128	,001	,449**	1	-,021	-,046	-,084	,150*	-,014	,022	,031	-,153*	,149*	-,037	,015
	Sig. (2-tailed)	,391	,148	,002	,077	,990	,000		,770	,526	,249	,039	,843	,759	,666	,035	,040	,617	,836
	N	190	126	186	190	189	190	190	190	190	190	190	190	190	190	190	190	189	190
Density	Pearson Correlation	,172*	,198*	,128	-,029	,067	-,123	-,021	1	,784**	,495**	-,299**	-,220**	-,675**	-,567**	-,288**	,072	,086	-,340**
	Sig. (2-tailed)	,016	,023	,077	,685	,353	,087	,770		,000	,000	,000	,002	,000	,000	,000	,315	,232	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Density with valued tie	Pearson Correlation	,170*	,221*	,133	,020	,049	-,073	-,046	,784**	1	,890**	-,407**	-,249**	-,528**	-,400**	-,167*	-,043	,177*	-,317**
	Sig. (2-tailed)	,018	,011	,067	,780	,495	,314	,526	,000		,000	,000	,000	,000	,000	,019	,552	,014	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Strength of ties	Pearson Correlation	,124	,166	,038	,004	,047	-,088	-,084	,495**	,890**	1	-,347**	-,181*	-,207**	-,141*	,052	-,090	,206**	-,108
	Sig. (2-tailed)	,084	,058	,599	,956	,515	,222	,249	,000	,000		,000	,011	,004	,049	,470	,209	,004	,135
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Centralization (all degree)	Pearson Correlation	-,016	-,035	,130	-,056	,037	,078	,150*	-,299**	-,407**	-,347**	1	,755**	,217**	-,158*	-,082	,658**	-,057	,147*
	Sig. (2-tailed)	,825	,692	,072	,436	,607	,281	,039	,000	,000	,000		,000	,002	,027	,254	,000	,431	,040
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Centralization (betweeness)	Pearson Correlation	,079	,066	,092	-,103	-,059	,054	-,014	-,220**	-,249**	-,181*	,755**	1	,276**	-,306**	,154*	,653**	-,346**	-,149*
	Sig. (2-tailed)	,270	,454	,206	,153	,411	,458	,843	,002	,000	,011	,000		,000	,000	,032	,000	,000	,038
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Eigenvector centralization	Pearson Correlation	-,129	-,177*	-,123	-,036	-,144*	-,061	,022	-,675**	-,528**	-,207**	,217**	,276**	1	,484**	,233**	-,065	-,051	,215**
	Sig. (2-tailed)	,072	,043	,089	,618	,046	,400	,759	,000	,000	,004	,002	,000		,000	,001	,365	,483	,003
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Size	Pearson Correlation	-,223**	-,265**	-,191**	-,007	,197**	,059	,031	-,567**	-,400**	-,141*	-,158*	-,306**	,484**	1	,299**	-,307**	,311**	,600**
	Sig. (2-tailed)	,002	,002	,008	,928	,006	,414	,666	,000	,000	,049	,027	,000	,000		,000	,000	,000	,000
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Ties to other teams "others"	Pearson Correlation	-,015	,022	-,216**	-,091	-,095	,002	-,153*	-,288**	-,167*	,052	-,082	,154*	,233**	,299**	1	,077	-,108	,217**
	Sig. (2-tailed)	,833	,804	,003	,207	,190	,979	,035	,000	,019	,470	,254	,032	,001	,000		,284	,135	,002
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Ties to other leaders	Pearson Correlation	,045	,081	,168*	-,100	-,019	,067	,149*	,072	-,043	-,090	,658**	,653**	-,065	-,307**	,077	1	-,114	-,103
	Sig. (2-tailed)	,531	,357	,020	,163	,789	,357	,040	,315	,552	,209	,000	,000	,365	,000	,284		,115	,150
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195
Professional background "organizations"	Pearson Correlation	-,168*	-,201*	-,105	-,009	,318**	-,194**	-,037	,086	,177*	,206**	-,057	-,346**	-,051	,311**	-,108	-,114	1	,484**
	Sig. (2-tailed)	,019	,022	,148	,901	,000	,007	,617	,232	,014	,004	,431	,000	,483	,000	,135	,115		,000
	N	194	130	190	193	192	192	189	194	194	194	194	194	194	194	194	194	194	194
Team typology	Pearson Correlation	-,215**	-,235**	-,203**	-,082	,291**	-,113	,015	-,340**	-,317**	-,108	,147*	-,149*	,215**	,595**	,217**	-,103	,495**	1
	Sig. (2-tailed)	,003	,007	,005	,258	,000	,118	,836	,000	,000	,135	,040	,038	,003	,000	,002	,150	,000	
	N	195	131	191	194	193	193	190	195	195	195	195	195	195	195	195	195	194	195

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix B.2: Demographic and organisational chara cteristics of less and more effective Slovenian teams

		Analysis 1	
		Less effective teams	More effective teams
Gender (1 = men)	Mean	1	1
	Standard Deviation	0	0
Age (1 = less 25; 25-40 years)	Mean	2	2
	Standard Deviation	1	0
Education(1= elementary and high school)	Mean	2	2
	Standard Deviation	1	1
Size	Mean	10	9
	Standard Deviation	5	3
Team tenure	Mean	5.0	6.0
	Standard Deviation	2.8	3.2
Professional background	Mean	4	3
	Standard Deviation	2	2
Team typology	Mean	2	1
	Standard Deviation	0	1
Team self-management level	Mean	4.00	4.15
	Standard Deviation	.41	.20
Team effectiveness	Mean	3.91	4.35
	Standard Deviation	.20	.13
	Valid N	12	14

Appendix B.3: Demographic and organisational characteristics of the least, medium and most effective Slovenian teams

		Analysis 2		
		Least effective teams	Medium effective teams	Most effective teams
Gender (1 = men)	Mean	1	1	1
	Standard Deviation	0	0	0
Age (1 = less 25; 25-40 years)	Mean	2	2	2
	Standard Deviation	0	1	0
Education (1= elementary and high school)	Mean	2	2	2
	Standard Deviation	1	1	1
Size	Mean	11	9	8
	Standard Deviation	5	4	2
Team tenure	Mean	5.3	6.0	5.4
	Standard Deviation	3.1	4.1	1.5
Professional background	Mean	4	3	3
	Standard Deviation	2	2	2
Team typology	Mean	2	2	1
	Standard Deviation	0	1	0
Team self-management level	Mean	3.93	4.18	4.14
	Standard Deviation	.45	.12	.25
Team effectiveness	Mean	3.85	4.19	4.44
	Standard Deviation	.19	.07	.10
	Valid N	9	9	8

Appendix B.4: Advice network characteristics of less and more effective Slovenian teams

		Analysis 1	
		Less effective teams	More effective teams
Density	Mean	.83	.88
	Standard Deviation	.16	.13
Density with valued ties	Mean	.52	.55
	Standard Deviation	.21	.17
Strength of ties	Mean	2.4	2.5
	Standard Deviation	.6	.5
Centralisation (in-degree)	Mean	.15	.11
	Standard Deviation	.13	.08
Centralisation (betweenness)	Mean	.051	.034
	Standard Deviation	.087	.048
Eigenvector centralisation	Mean	.23	.21
	Standard Deviation	.09	.10
Multiplexity	Mean	.430	.353
	Standard Deviation	.273	.189
Ties to other teams	Mean	49	50
	Standard Deviation	29	24
Ties to other team leaders	Mean	12	15
	Standard Deviation	5	10
	Valid N	12	14

Appendix B.5: Advice network characteristics of the least, medium and most effective Slovenian teams

		Analysis 2		
		Least effective teams	Medium effective teams	Most effective teams
Density	Mean	.79	.85	.94
	Standard Deviation	.17	.15	.07
Density with valued ties	Mean	.46	.55	.61
	Standard Deviation	.19	.17	.18
Strength of ties	Mean	2.3	2.5	2.6
	Standard Deviation	.5	.4	.6
Centralisation (in-degree)	Mean	.19	.12	.08
	Standard Deviation	.12	.09	.08
Centralisation (betweenness)	Mean	.067	.041	.015
	Standard Deviation	.096	.055	.027
Eigenvector centralisation	Mean	.24	.24	.18
	Standard Deviation	.09	.09	.10
Multiplexity	Mean	.462	.407	.285
	Standard Deviation	.272	.172	.225
Ties to other teams	Mean	50	51	48
	Standard Deviation	31	28	21
Ties to other team leaders	Mean	11	13	16
	Standard Deviation	6	10	10
	Valid N	9	9	8

Appendix B.6: Socialising network characteristics of less and more effective Slovenian teams

		Analysis 1	
		Less effective teams	More effective teams
Density	Mean	.45	.54
	Standard Deviation	.29	.28
Density with valued ties	Mean	.14	.20
	Standard Deviation	.10	.20
Strength of ties	Mean	1.1	1.3
	Standard Deviation	.4	.6
Centralisation (all-degree)	Mean	.29	.30
	Standard Deviation	.18	.18
Centralisation (betweenness)	Mean	.149	.155
	Standard Deviation	.167	.149
Eigenvector centralisation	Mean	.45	.42
	Standard Deviation	.28	.25
Ties to other teams	Mean	19	23
	Standard Deviation	13	14
Ties to other team leaders	Mean	4	6
	Standard Deviation	4	9
	Valid N	12	14

Appendix B.7: Socialising network characteristics of the least, medium and most effective Slovenian teams

		Analysis 2		
		Least effective teams	Medium effective teams	Most effective teams
Density	Mean	.50	.41	.61
	Standard Deviation	.30	.24	.31
Density with valued ties	Mean	.16	.12	.25
	Standard Deviation	.10	.07	.26
Strength of ties	Mean	1.2	1.0	1.4
	Standard Deviation	.2	.4	.8
Centralisation (all-degree)	Mean	.30	.31	.28
	Standard Deviation	.17	.15	.23
Centralisation (betweenness)	Mean	.148	.125	.186
	Standard Deviation	.165	.122	.186
Eigenvector centralisation	Mean	.53	.42	.34
	Standard Deviation	.25	.30	.21
Ties to other teams	Mean	20	19	24
	Standard Deviation	13	15	13
Ties to other team leaders	Mean	4	5	7
	Standard Deviation	4	5	11
	Valid N	9	9	8

Appendix B.8: Social networks and intercorrelation measures in the Slovenian teams

Advice network	Cronbach's Alpha (α)	Minimum[34]	Maximum[35]
Density Density with valued ties Strength of ties	.768	.620	.891
Centralisation (in-degree) Centralisation (betweenness) Eigenvector centralisation	.803	.552	.696

Socialising network	Cronbach's Alpha (α)	Minimum	Maximum
Density Density with valued ties Strength of ties	.759	.495	.890
Centralisation (all degree) Centralisation (betweenness) Eigenvector centralisation	.564	.217	.755

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[34] Inter-item correlations

[35] Inter-item correlations

Appendix C: Socialising network of the Finnish teams – correlation matrix

Correlations

		Analysis	Age	Gender	Education	Organizational tenure	Team tenure	Size	Density	Density with valued ties	Tie strength	Centralization (all degree)	Eigenvector centralization	Ties to other teams "others"	Ties to other leaders	Profesional background "organizations"	Team typology
Analysis	Pearson Correlation	1	,002	,009	-,016	-,227	-,460**	,177	-,012	-,011	,078	-,003	,187	,283*	,237	,121	,191
	Sig. (2-tailed)		,990	,952	,910	,113	,001	,219	,932	,941	,589	,984	,193	,046	,098	,404	,185
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Age	Pearson Correlation	,002	1	,209	,420**	,309*	,155	-,084	,253	,255	,289*	,168	,188	,129	,088	,237	,065
	Sig. (2-tailed)	,990		,145	,002	,029	,287	,563	,076	,074	,042	,244	,191	,370	,545	,097	,656
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Gender	Pearson Correlation	,009	,209	1	,356*	-,347*	,049	,054	-,066	-,063	,020	,074	,030	,162	,153	,336*	,127
	Sig. (2-tailed)	,952	,145		,011	,014	,739	,710	,647	,665	,893	,609	,839	,260	,290	,017	,378
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Education	Pearson Correlation	-,016	,420**	,356*	1	-,203	-,126	-,067	-,055	-,072	,053	,126	,129	-,003	-,032	,298*	,211
	Sig. (2-tailed)	,910	,002	,011		,158	,389	,645	,703	,619	,715	,382	,371	,983	,826	,036	,141
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Organizational tenure	Pearson Correlation	-,227	,309*	-,347*	-,203	1	,230	,045	,416**	,425**	,300*	,072	,064	,137	,141	-,073	-,338*
	Sig. (2-tailed)	,113	,029	,014	,158		,111	,754	,003	,002	,034	,621	,659	,344	,330	,617	,016
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Team tenure	Pearson Correlation	-,460**	,155	,049	-,126	,230	1	-,214	,219	,243	,259	,231	,132	-,111	-,120	,056	,039
	Sig. (2-tailed)	,001	,287	,739	,389	,111		,140	,130	,093	,073	,111	,368	,449	,413	,703	,790
	N	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Size	Pearson Correlation	,177	-,084	,054	-,067	,045	-,214	1	,108	,101	,233	,344*	,302*	,422**	,528**	,114	-,745**
	Sig. (2-tailed)	,219	,563	,710	,645	,754	,140		,454	,485	,104	,015	,033	,002	,000	,432	,000
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Density	Pearson Correlation	-,012	,253	-,066	-,055	,416**	,219	,108	1	,993**	,855**	,287*	,357*	,602**	,451**	,196	-,486**
	Sig. (2-tailed)	,932	,076	,647	,703	,003	,130	,454		,000	,000	,044	,011	,000	,001	,173	,000
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Density with valued ties	Pearson Correlation	-,011	,255	-,063	-,072	,425**	,243	,101	,993**	1	,846**	,278	,332*	,598**	,460**	,156	-,484**
	Sig. (2-tailed)	,941	,074	,665	,619	,002	,093	,485	,000		,000	,050	,019	,000	,001	,280	,000
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Tie strength	Pearson Correlation	,078	,289*	,020	,053	,300*	,259	,233	,855**	,846**	1	,727**	,776**	,373**	,225	,274	-,313*
	Sig. (2-tailed)	,589	,042	,893	,715	,034	,073	,104	,000	,000		,000	,000	,008	,117	,054	,027
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Centralization (all degree)	Pearson Correlation	-,003	,168	,074	,126	,072	,231	,344*	,287*	,278	,727**	1	,958**	-,165	-,230	,113	-,078
	Sig. (2-tailed)	,984	,244	,609	,382	,621	,111	,015	,044	,050	,000		,000	,253	,108	,434	,588
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Eigenvector centralization	Pearson Correlation	,187	,188	,030	,129	,064	,132	,302*	,357*	,332*	,776**	,958**	1	-,099	-,191	,194	-,026
	Sig. (2-tailed)	,193	,191	,839	,371	,659	,368	,033	,011	,019	,000	,000		,493	,183	,178	,856
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Ties to other teams "others"	Pearson Correlation	,283*	,129	,162	-,003	,137	-,111	,422**	,602**	,598**	,373**	-,165	-,099	1	,949**	,525**	-,513**
	Sig. (2-tailed)	,046	,370	,260	,983	,344	,449	,002	,000	,000	,008	,253	,493		,000	,000	,000
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Ties to other leaders	Pearson Correlation	,237	,088	,153	-,032	,141	-,120	,528**	,451**	,460**	,225	-,230	-,191	,949**	1	,516**	-,571**
	Sig. (2-tailed)	,098	,545	,290	,826	,330	,413	,000	,001	,001	,117	,108	,183	,000		,000	,000
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Profesional background "organizations"	Pearson Correlation	,121	,237	,336*	,298*	-,073	,056	,114	,196	,156	,274	,113	,194	,525**	,516**	1	,134
	Sig. (2-tailed)	,404	,097	,017	,036	,617	,703	,432	,173	,280	,054	,434	,178	,000	,000		,352
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50
Team typology	Pearson Correlation	,191	,065	,127	,211	-,338*	,039	-,745**	-,486**	-,484**	-,313*	-,078	-,026	-,513**	-,571**	,134	1
	Sig. (2-tailed)	,185	,656	,378	,141	,016	,790	,000	,000	,000	,027	,588	,856	,000	,000	,352	
	N	50	50	50	50	50	49	50	50	50	50	50	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix C.1: Demographic and organisational characteristics of less and more effective Finnish teams

		Analysis	
		Less effective teams	More effective teams
Gender (1 = men)	Mean	2	2
	Standard Deviation	0	0
Age (1 = less 25; 25-40 years)	Mean	2	2
	Standard Deviation	0	0
Education (1= elementary and high school)	Mean	3	3
	Standard Deviation	1	1
Size	Mean	8	8
	Standard Deviation	2	2
Team tenure	Mean	5.3	2.3
	Standard Deviation	2.2	1.0
Professional background	Mean	4	4
	Standard Deviation	1	1
Team typology	Mean	1	2
	Standard Deviation	1	1
Team self-management level	Mean	3.46	3.79
	Standard Deviation	.20	.35
Team effectiveness	Mean	3.79	4.22
	Standard Deviation	.07	.33
	Valid N	4	4

Appendix C.2: Socialising network characteristics of less and more effective Finnish teams

		Analysis	
		Less effective teams	More effective teams
Density	Mean	.43	.36
	Standard Deviation	.35	.31
Density with valued ties	Mean	.14	.11
	Standard Deviation	.11	.10
Tie strength	Mean	.91	.93
	Standard Deviation	.61	.64
Centralisation	Mean	.32	.34
	Standard Deviation	.23	.28
Eigenvector centralisation	Mean	.25	.34
	Standard Deviation	.19	.26
Ties to other teams	Mean	11	17
	Standard Deviation	5	22
Ties to other leaders	Mean	4	6
	Standard Deviation	3	9
	Valid N	4	4

Appendix D: Advice network of the Slovenian team leaders – correlation matrix

Correlations

		Analysis1	Analysis2	Gender	Age	Education	Organizational tenure	Team tenure	Centrality (indegree)	Centrality (betweenness)	Centrality (outdegree)	Eigenvector centrality	Strength of ties	Simmelian ties	Ties to other teams "others"	Ties to other leaders	Professional background "organizations"	Multiplexity	Team typology
Analysis1	Pearson Correlation	1	,816**	-,149	,031	-,374	,115	-,067	,046	-,218	-,116	,018	,070	-,159	-,022	-,117	,040	,063	-,238
	Sig. (2-tailed)		,000	,469	,881	,060	,577	,744	,823	,285	,573	,932	,733	,437	,918	,579	,846	,760	,241
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Analysis2	Pearson Correlation	,816**	1	-,132	-,019	-,412*	-,040	-,298	,207	-,327	,120	,044	,213	-,212	-,056	-,128	,244	-,086	-,426*
	Sig. (2-tailed)	,000		,521	,926	,037	,847	,139	,309	,103	,558	,833	,295	,299	,791	,542	,230	,677	,030
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Gender	Pearson Correlation	-,149	-,132	1	-,064	,092	-,118	,153	,160	,379	,132	,208	,019	-,212	-,200	,077	,052	,164	-,149
	Sig. (2-tailed)	,469	,521		,755	,656	,567	,456	,434	,056	,519	,308	,928	,298	,338	,715	,800	,425	,469
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Age	Pearson Correlation	,031	-,019	-,064	1	,499**	,338	,316	,075	-,035	-,316	-,293	-,015	,218	-,246	-,005	,093	-,026	,299
	Sig. (2-tailed)	,881	,926	,755		,009	,091	,116	,717	,865	,116	,147	,941	,284	,236	,980	,652	,900	,138
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Education	Pearson Correlation	-,374	-,412*	,092	,499**	1	,353	,399*	,005	,247	-,249	-,516**	-,171	,408*	-,181	,087	-,366	-,040	,459*
	Sig. (2-tailed)	,060	,037	,656	,009		,077	,043	,980	,224	,221	,007	,402	,038	,388	,680	,066	,844	,018
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Organizational tenure	Pearson Correlation	,115	-,040	-,118	,338	,353	1	,610**	-,082	,239	-,395*	-,476*	-,531**	,609**	-,165	-,105	-,399*	-,131	,517**
	Sig. (2-tailed)	,577	,847	,567	,091	,077		,001	,690	,241	,046	,014	,005	,001	,430	,618	,044	,523	,007
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Team tenure	Pearson Correlation	-,067	-,298	,153	,316	,399*	,610**	1	-,114	,385	-,399*	-,206	-,434*	,294	-,155	,108	-,193	,032	,409*
	Sig. (2-tailed)	,744	,139	,456	,116	,043	,001		,581	,052	,043	,313	,027	,144	,461	,608	,346	,876	,038
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Centrality (indegree)	Pearson Correlation	,046	,207	,160	,075	,005	-,082	-,114	1	-,245	,154	-,067	,495*	-,112	,296	,357	,172	,337	-,119
	Sig. (2-tailed)	,823	,309	,434	,717	,980	,690	,581		,229	,452	,747	,010	,586	,150	,080	,401	,092	,561
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Centrality (betweenness)	Pearson Correlation	-,218	-,327	,379	-,035	,247	,239	,385	-,245	1	,084	,187	-,454*	-,155	-,124	-,257	-,308	,074	,147
	Sig. (2-tailed)	,285	,103	,056	,865	,224	,241	,052	,229		,683	,359	,020	,448	,554	,216	,125	,718	,472
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Centrality (outdegree)	Pearson Correlation	-,116	,120	,132	-,316	-,249	-,395*	-,399*	,154	,084	1	,316	,213	-,319	,299	,297	,222	,213	-,181
	Sig. (2-tailed)	,573	,558	,519	,116	,221	,046	,043	,452	,683		,116	,297	,113	,146	,150	,275	,296	,376
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Eigenvector centrality	Pearson Correlation	,018	,044	,208	-,293	-,516**	-,476*	-,206	-,067	,187	,316	1	,404*	-,829**	,011	-,152	,160	-,070	-,558**
	Sig. (2-tailed)	,932	,833	,308	,147	,007	,014	,313	,747	,359	,116		,041	,000	,959	,469	,435	,733	,003
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Strength of ties	Pearson Correlation	,070	,213	,019	-,015	-,171	-,531**	-,434*	,495*	-,454*	,213	,404*	1	-,455*	,108	,162	,175	,123	-,337
	Sig. (2-tailed)	,733	,295	,928	,941	,402	,005	,027	,010	,020	,297	,041		,020	,606	,438	,392	,548	,093
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Simmelian ties	Pearson Correlation	-,159	-,212	-,212	,218	,408*	,609**	,294	-,112	-,155	-,319	-,829**	-,455*	1	,057	,032	-,242	-,082	,650**
	Sig. (2-tailed)	,437	,299	,298	,284	,038	,001	,144	,586	,448	,113	,000	,020		,787	,880	,233	,691	,000
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Ties to other teams "others"	Pearson Correlation	-,022	-,056	-,200	-,246	-,181	-,165	-,155	,296	-,124	,299	,011	,108	,057	1	,610**	-,187	,028	-,202
	Sig. (2-tailed)	,918	,791	,338	,236	,388	,430	,461	,150	,554	,146	,959	,606	,787		,001	,371	,895	,332
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Ties to other leaders	Pearson Correlation	-,117	-,128	,077	-,005	,087	-,105	,108	,357	-,257	,297	-,152	,162	,032	,610**	1	-,056	-,016	-,033
	Sig. (2-tailed)	,579	,542	,715	,980	,680	,618	,608	,080	,216	,150	,469	,438	,880	,001		,792	,939	,874
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Professional background "organizations"	Pearson Correlation	,040	,244	,052	,093	-,366	-,399*	-,193	,172	-,308	,222	,160	,175	-,242	-,187	-,056	1	,326	-,308
	Sig. (2-tailed)	,846	,230	,800	,652	,066	,044	,346	,401	,125	,275	,435	,392	,233	,371	,792		,104	,126
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Multiplexity	Pearson Correlation	,063	-,086	,164	-,026	-,040	-,131	,032	,337	,074	,213	-,070	,123	-,082	,028	-,016	,326	1	-,031
	Sig. (2-tailed)	,760	,677	,425	,900	,844	,523	,876	,092	,718	,296	,733	,548	,691	,895	,939	,104		,881
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26
Team typology	Pearson Correlation	-,238	-,426*	-,149	,299	,459*	,517**	,409*	-,119	,147	-,181	-,558**	-,337	,650**	-,202	-,033	-,308	-,031	1
	Sig. (2-tailed)	,241	,030	,469	,138	,018	,007	,038	,561	,472	,376	,003	,093	,000	,332	,874	,126	,881	
	N	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26	26

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix D.1: Socialising network of the Slovenian team leaders – correlation matrix

Correlations

		Analysis1	Analysis2	Gender	Age	Education	Organizational tenure	Team tenure	Centrality (all degree)	Centrality (betweenness)	Eigenvector centrality	Strength of ties	Simmelian ties	Ties to other teams "others"	Ties to other leaders	Professional background "organizations"	Team typology
Analysis1	Pearson Correlation	1	,816**	-,149	,031	-,374	,115	-,067	,164	-,051	,187	,240	,054	-,122	-,144	,040	-,238
	Sig. (2-tailed)		,000	,469	,881	,060	,577	,744	,424	,805	,360	,237	,795	,562	,494	,846	,241
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Analysis2	Pearson Correlation	,816**	1	-,132	-,019	-,412*	-,040	-,298	,069	-,187	,226	,213	,063	-,178	-,313	,244	-,426*
	Sig. (2-tailed)	,000		,521	,926	,037	,847	,139	,737	,360	,268	,297	,759	,394	,128	,230	,030
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Gender	Pearson Correlation	-,149	-,132	1	-,064	,092	-,118	,153	,084	,345	,024	,006	-,105	,017	,273	,052	-,149
	Sig. (2-tailed)	,469	,521		,755	,656	,567	,456	,684	,084	,907	,978	,609	,934	,187	,800	,469
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Age	Pearson Correlation	,031	-,019	-,064	1	,499**	,338	,316	,059	-,230	-,019	,192	-,008	-,322	-,197	,093	,299
	Sig. (2-tailed)	,881	,926	,755		,009	,091	,116	,773	,259	,928	,347	,969	,116	,344	,652	,138
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Education	Pearson Correlation	-,374	-,412*	,092	,499**	1	,353	,399*	-,045	-,058	-,014	-,087	-,007	-,025	-,014	-,366	,459*
	Sig. (2-tailed)	,060	,037	,656	,009		,077	,043	,827	,779	,946	,672	,971	,904	,947	,066	,018
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Organizational tenure	Pearson Correlation	,115	-,040	-,118	,338	,353	1	,610**	-,168	,121	-,324	-,215	-,210	-,233	-,137	-,399*	,517**
	Sig. (2-tailed)	,577	,847	,567	,091	,077		,001	,412	,556	,106	,291	,304	,262	,512	,044	,007
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Team tenure	Pearson Correlation	-,067	-,298	,153	,316	,399*	,610**	1	-,051	,186	-,329	-,075	-,009	-,046	,131	-,193	,409*
	Sig. (2-tailed)	,744	,139	,456	,116	,043	,001		,806	,362	,101	,716	,964	,828	,533	,346	,038
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Centrality (all degree)	Pearson Correlation	,164	,069	,084	,059	-,045	-,168	-,051	1	,257	,627**	,727**	,720**	,369	,180	,428*	-,087
	Sig. (2-tailed)	,424	,737	,684	,773	,827	,412	,806		,205	,001	,000	,000	,070	,388	,029	,673
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Centrality (betweenness)	Pearson Correlation	-,051	-,187	,345	-,230	-,058	,121	,186	,257	1	,151	,007	-,158	-,107	,061	-,158	,139
	Sig. (2-tailed)	,805	,360	,084	,259	,779	,556	,362	,205		,461	,974	,441	,610	,771	,442	,497
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Eigenvector centrality	Pearson Correlation	,187	,226	,024	-,019	-,014	-,324	-,329	,627**	,151	1	,302	,240	,179	,012	,095	-,284
	Sig. (2-tailed)	,360	,268	,907	,928	,946	,106	,101	,001	,461		,134	,238	,391	,955	,645	,159
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Strength of ties	Pearson Correlation	,240	,213	,006	,192	-,087	-,215	-,075	,727**	,007	,302	1	,656**	,200	-,025	,502**	-,162
	Sig. (2-tailed)	,237	,297	,978	,347	,672	,291	,716	,000	,974	,134		,000	,338	,907	,009	,430
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Simmelian ties	Pearson Correlation	,054	,063	-,105	-,008	-,007	-,210	-,009	,720**	-,158	,240	,656**	1	,422*	,013	,557**	-,079
	Sig. (2-tailed)	,795	,759	,609	,969	,971	,304	,964	,000	,441	,238	,000		,036	,951	,003	,703
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Ties to other teams "others"	Pearson Correlation	-,122	-,178	,017	-,322	-,025	-,233	-,046	,369	-,107	,179	,200	,422*	1	,732**	,124	-,327
	Sig. (2-tailed)	,562	,394	,934	,116	,904	,262	,828	,070	,610	,391	,338	,036		,000	,554	,111
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Ties to other leaders	Pearson Correlation	-,144	-,313	,273	-,197	-,014	-,137	,131	,180	,061	,012	-,025	,013	,732**	1	,023	-,238
	Sig. (2-tailed)	,494	,128	,187	,344	,947	,512	,533	,388	,771	,955	,907	,951	,000		,913	,252
	N	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Professional background "organizations"	Pearson Correlation	,040	,244	,052	,093	-,366	-,399*	-,193	,428*	-,158	,095	,502**	,557**	,124	,023	1	-,308
	Sig. (2-tailed)	,846	,230	,800	,652	,066	,044	,346	,029	,442	,645	,009	,003	,554	,913		,126
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26
Team typology	Pearson Correlation	-,238	-,426*	-,149	,299	,459*	,517**	,409*	-,087	,139	-,284	-,162	-,079	-,327	-,238	-,308	1
	Sig. (2-tailed)	,241	,030	,469	,138	,018	,007	,038	,673	,497	,159	,430	,703	,111	,252	,126	
	N	26	26	26	26	26	26	26	26	26	26	26	26	25	25	26	26

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix D.2: Demographic and organisational characteristics, performance evaluations and satisfaction with teamwork of team leaders of less and more effective Slovenian teams

		Analysis 1	
		Leaders of less effective teams	Leaders of more effective teams
Gender (1 = men)	Mean	1	1
	Standard Deviation	0	0
Age (1= less than 25 years)	Mean	3	3
	Standard Deviation	0	1
Education (1= elementary school)	Mean	5	4
	Standard Deviation	1	1
Organisational tenure	Mean	12.3	14.1
	Standard Deviation	9.5	7.2
Team tenure	Mean	7.9	6.9
	Standard Deviation	8.7	7.6
Professional background	Mean	0	1
	Standard Deviation	0	0
Team effectiveness (leaders' evaluation)	Mean	4.09	4.49
	Standard Deviation	.45	.36
Team self-management (leaders' evaluation)	Mean	3.82	4.21
	Standard Deviation	.87	.50
Team effectiveness	Mean	3.91	4.35
	Standard Deviation	.20	.13
Team self-management	Mean	4.00	4.15
	Standard Deviation	.41	.20
Leaders' satisfaction with teamwork	Mean	1	1
	Standard Deviation	0	0
	Valid N	12	14

Appendix D.3: Demographic and organisational characteristics, performance evaluations and satisfaction with teamwork of team leaders of the least, medium and most effective Slovenian teams

		Analysis 2		
		Leaders of least effective teams	Leaders of medium effective teams	Leaders of most effective teams
Gender (1 = men)	Mean	1	1	1
	Standard Deviation	0	0	0
Age (1= less than 25 years)	Mean	3	3	3
	Standard Deviation	0	1	1
Education (1= elementary school)	Mean	5	4	4
	Standard Deviation	1	1	0
Organisational tenure	Mean	14.0	12.6	13.3
	Standard Deviation	8.9	9.7	6.5
Team tenure	Mean	10.0	7.5	4.2
	Standard Deviation	9.2	9.3	3.5
Professional background	Mean	0	0	1
	Standard Deviation	0	0	1
Team effectiveness (leaders' evaluation)	Mean	4.04	4.26	4.63
	Standard Deviation	.52	.27	.32
Team self-management (leaders' evaluation)	Mean	3.67	4.08	4.33
	Standard Deviation	.98	.50	.44
Team effectiveness	Mean	3.85	4.19	4.44
	Standard Deviation	.19	.07	.10
Team self-management	Mean	3.93	4.18	4.14
	Standard Deviation	.45	.12	.25
Leaders' satisfaction with teamwork	Mean	1	1	1
	Standard Deviation	0	0	0
	Valid N	9	9	8

Appendix D.4: Advice network characteristics of the Slovenian team leaders of less and more effective teams

		Analysis 1	
		Leaders of less effective teams	Leaders of more effective teams
Centrality (in-degree)	Mean	.95	.96
	Standard Deviation	.12	.08
Centrality (betweenness)	Mean	.06	.03
	Standard Deviation	.09	.04
Centrality (out-degree)	Mean	.98	.96
	Standard Deviation	.05	.11
Eigenvector centrality	Mean	.393	.396
	Standard Deviation	.086	.061
Strength of ties	Mean	2.6	2.7
	Standard Deviation	.9	.6
Simmelian ties	Mean	47	37
	Standard Deviation	42	19
Multiplexity	Mean	.446	.482
	Standard Deviation	.323	.268
Ties to other teams	Mean	7	7
	Standard Deviation	3	4
Ties to other leaders	Mean	4	3
	Standard Deviation	3	3
	Valid N	12	14

Appendix D.5: Advice network characteristics of team leaders of the least, medium and most effective Slovenian teams

		Analysis 2		
		Leaders of least effective teams	Leaders of medium effective teams	Leaders of most effective teams
Centrality (in-degree)	Mean	.94	.95	.99
	Standard Deviation	.14	.10	.04
Centrality (betweenness)	Mean	.08	.03	.03
	Standard Deviation	.10	.04	.04
Centrality (out-degree)	Mean	.97	.94	1.00
	Standard Deviation	.05	.13	.00
Eigenvector centrality	Mean	.388	.401	.395
	Standard Deviation	.082	.073	.067
Strength of ties	Mean	2.3	2.8	2.7
	Standard Deviation	.9	.7	.7
Simmelian ties	Mean	49	41	33
	Standard Deviation	38	36	16
Multiplexity	Mean	.534	.383	.479
	Standard Deviation	.289	.301	.290
Ties to other teams	Mean	0	0	1
	Standard Deviation	4	2	4
Ties to other leaders	Mean	4	4	3
	Standard Deviation	3	3	3
	Valid N	9	9	8

Appendix D.6: Socialising network characteristics of team leaders of less and more effective Slovenian teams

		Analysis 1	
		Leaders of less effective teams	Leaders of more effective teams
Centrality (all degree)	Mean	.47	.57
	Standard Deviation	.33	.33
Centrality (betweenness)	Mean	.06	.05
	Standard Deviation	.15	.09
Eigenvector centrality	Mean	.278	.326
	Standard Deviation	.162	.102
Strength of ties	Mean	.5	.8
	Standard Deviation	.4	.7
Simmelian ties	Mean	8	10
	Standard Deviation	12	14
Ties to other teams	Mean	0	0
	Standard Deviation	3	3
Ties to other leaders	Mean	1	1
	Standard Deviation	2	2
	Valid N	12	14

Appendix D.7: Socialising network characteristics of team leaders of the least, medium and most effective Slovenian teams

		Analysis 2		
		Leaders of least effective teams	Leaders of medium effective teams	Leaders of most effective teams
Centrality (all degree)	Mean	.56	.40	.63
	Standard Deviation	.32	.30	.35
Centrality (betweenness)	Mean	.08	.06	.03
	Standard Deviation	.17	.11	.06
Eigenvector centrality	Mean	.294	.256	.370
	Standard Deviation	.144	.147	.080
Strength of ties	Mean	.6	.5	.9
	Standard Deviation	.3	.4	.9
Simmelian ties	Mean	10	4	13
	Standard Deviation	14	7	17
Ties to other teams	Mean	3	2	2
	Standard Deviation	3	3	3
Ties to other leaders	Mean	2	1	0
	Standard Deviation	2	2	0
	Valid N	9	9	8

Appendix E: Social networks of the Finnish team leaders – correlation matrix

Correlations

		Analysis	Age	Gender	Education	Organizational tenure	Team tenure	Tie strength	Centrality outdegree-advice network	Centrality all degree-socializing network	Betweenness centrality-socializing network	Eigenvector centrality-socializing network	Simmelian ties-socializing network	Professional background "organizations"	Ties to others teams - advice ties	Ties to others teams - socializing ties	Ties to other leaders - advice ties	Ties to other leaders - socializing ties	Team typology
Analysis	Pearson Correlation	1	-,730	ᵃ	ᵃ	-,546	-,212	,373	,354	-,313	-,065	-,157	-,359	,417	,645	,452	,676	,452	,417
	Sig. (2-tailed)		,062	.	.	,204	,649	,409	,437	,494	,891	,737	,429	,352	,117	,308	,096	,308	,352
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Age	Pearson Correlation	-,730	1	ᵃ	ᵃ	,070	,123	,127	-,258	-,181	-,137	-,410	,058	-,091	-,306	-,736	-,540	-,716	-,091
	Sig. (2-tailed)	,062		.	.	,881	,793	,786	,576	,698	,770	,361	,901	,846	,504	,059	,211	,071	,846
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Gender	Pearson Correlation	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ
	Sig. (2-tailed)	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Education	Pearson Correlation	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ	ᵃ
	Sig. (2-tailed)	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Organizational tenure	Pearson Correlation	-,546	,070	ᵃ	ᵃ	1	-,195	-,545	,152	,572	,584	,598	,384	-,921**	-,905**	-,415	-,784*	-,417	-,096
	Sig. (2-tailed)	,204	,881	.	.		,675	,206	,746	,180	,168	,156	,395	,003	,005	,355	,037	,352	,837
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Team tenure	Pearson Correlation	-,212	,123	ᵃ	ᵃ	-,195	1	-,597	-,352	,474	,263	,387	,649	,398	-,080	,299	,008	,233	-,821*
	Sig. (2-tailed)	,649	,793	.	.	,675		,157	,439	,283	,569	,391	,115	,376	,864	,514	,986	,616	,023
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Tie strength	Pearson Correlation	,373	,127	ᵃ	ᵃ	-,545	-,597	1	,132	-,968**	-,500	-,920**	-,878**	,285	,683	-,169	,445	-,092	,833*
	Sig. (2-tailed)	,409	,786	.	.	,206	,157		,778	,000	,253	,003	,009	,535	,090	,718	,318	,844	,020
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Centrality outdegree advice network	Pearson Correlation	,354	-,258	ᵃ	ᵃ	,152	-,352	,132	1	,080	,247	-,136	,169	-,471	-,091	-,173	,103	,036	,354
	Sig. (2-tailed)	,437	,576	.	.	,746	,439	,778		,865	,593	,771	,717	,286	,846	,711	,826	,940	,437
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Centrality all degree socializing network	Pearson Correlation	-,313	-,181	ᵃ	ᵃ	,572	,474	-,968**	,080	1	,450	,879**	,915**	-,381	-,696	,152	-,406	,125	-,777*
	Sig. (2-tailed)	,494	,698	.	.	,180	,283	,000	,865		,311	,009	,004	,400	,082	,745	,366	,789	,040
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Betweenness centrality socializing network	Pearson Correlation	-,065	-,137	ᵃ	ᵃ	,584	,263	-,500	,247	,450	1	,571	,424	-,539	-,597	-,255	-,504	-,283	-,079
	Sig. (2-tailed)	,891	,770	.	.	,168	,569	,253	,593	,311		,181	,343	,212	,157	,582	,249	,539	,866
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Eigenvector centrality socializing network	Pearson Correlation	-,157	-,410	ᵃ	ᵃ	,598	,387	-,920**	-,136	,879**	,571	1	,658	-,325	-,603	,282	-,369	,169	-,615
	Sig. (2-tailed)	,737	,361	.	.	,156	,391	,003	,771	,009	,181		,108	,476	,152	,540	,416	,718	,142
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Simmelian ties socializing network	Pearson Correlation	-,359	,058	ᵃ	ᵃ	,384	,649	-,878**	,169	,915**	,424	,658	1	-,266	-,628	,025	-,370	,048	-,824*
	Sig. (2-tailed)	,429	,901	.	.	,395	,115	,009	,717	,004	,343	,108		,565	,131	,957	,414	,918	,023
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Professional background "organizations"	Pearson Correlation	,417	-,091	ᵃ	ᵃ	-,921**	,398	,285	-,471	-,381	-,539	-,325	-,266	1	,796*	,538	,676	,452	-,167
	Sig. (2-tailed)	,352	,846	.	.	,003	,376	,535	,286	,400	,212	,476	,565		,032	,213	,096	,308	,721
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Ties to others teams - advice ties	Pearson Correlation	,645	-,306	ᵃ	ᵃ	-,905**	-,080	,683	-,091	-,696	-,597	-,603	-,628	,796*	1	,546	,915**	,564	,344
	Sig. (2-tailed)	,117	,504	.	.	,005	,864	,090	,846	,082	,157	,152	,131	,032		,205	,004	,187	,450
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Ties to others teams - socializing ties	Pearson Correlation	,452	-,736	ᵃ	ᵃ	-,415	,299	-,169	-,173	,152	-,255	,282	,025	,538	,546	1	,763*	,965**	-,318
	Sig. (2-tailed)	,308	,059	.	.	,355	,514	,718	,711	,745	,582	,540	,957	,213	,205		,046	,000	,487
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Ties to other leaders - advice ties	Pearson Correlation	,676	-,540	ᵃ	ᵃ	-,784*	,008	,445	,103	-,406	-,504	-,369	-,370	,676	,915**	,763*	1	,826*	,164
	Sig. (2-tailed)	,096	,211	.	.	,037	,986	,318	,826	,366	,249	,416	,414	,096	,004	,046		,022	,725
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Ties to other leaders - socializing ties	Pearson Correlation	,452	-,716	ᵃ	ᵃ	-,417	,233	-,092	,036	,125	-,283	,169	,048	,452	,564	,965**	,826*	1	-,251
	Sig. (2-tailed)	,308	,071	.	.	,352	,616	,844	,940	,789	,539	,718	,918	,308	,187	,000	,022		,587
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Team typology	Pearson Correlation	,417	-,091	ᵃ	ᵃ	-,096	-,821*	,833*	,354	-,777*	-,079	-,615	-,824*	-,167	,344	-,318	,164	-,251	1
	Sig. (2-tailed)	,352	,846	.	.	,837	,023	,020	,437	,040	,866	,142	,023	,721	,450	,487	,725	,587	
	N	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

a. Cannot be computed because at least one of the variables is constant.

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix E.1: Demographic and organisational characteristics, performance evaluations and satisfaction with teamwork of team leaders of less and more effective Finnish teams

		Analysis	
		Leaders of less effective teams	Leaders of more effective teams
Gender (1 = men)	Mean	2	2
	Standard Deviation	0	0
Age (1= less than 25 years)	Mean	3	2
	Standard Deviation	0	1
Education (1= elementary school)	Mean	5	5
	Standard Deviation	0	0
Organisational tenure	Mean	10.3	6.0
	Standard Deviation	2.4	5.3
Team tenure	Mean	2.9	2.2
	Standard Deviation	2.0	1.8
Professional background	Mean	0	1
	Standard Deviation	1	1
Team self-management	Mean	3.42	4.00
(leaders' evaluation)	Standard Deviation	.50	.58
Team effectiveness	Mean	3.91	4.31
(leaders' evaluation)	Standard Deviation	.18	.31
Team effectiveness	Mean	3.83	4.31
	Standard Deviation	.11	.35
Team self-management	Mean	3.49	3.82
	Standard Deviation	.24	.42
Leaders' satisfaction	Mean	1	1
with teamwork	Standard Deviation	0	0
	Valid N	4	3

Appendix E.2: Socialising network characteristics of team leaders of less and more effective Finnish teams

		Analysis	
		Leaders of less effective teams	Leaders of more effective teams
Advice network			
Centrality (out-degree)	Mean	.97	1.00
	Standard Deviation	.06	.00
Socialising network			
Centrality (all degree)	Mean	.66	.44
	Standard Deviation	.38	.39
Betweenness centrality	Mean	.14	.11
	Standard Deviation	.25	.19
Eigenvector centrality	Mean	.39	.32
	Standard Deviation	.18	.29
Tie strength	Mean	1.8	2.4
	Standard Deviation	.9	.9
Simmelian ties	Mean	9	4
	Standard Deviation	8	5
Ties to other teams (advice)	Mean	3	8
	Standard Deviation	3	3
Ties to other teams (socialising)	Mean	1	4
	Standard Deviation	2	5
Ties to other leaders (advice)	Mean	1	4
	Standard Deviation	2	3
Ties to other leaders (socialising)	Mean	1	2
	Standard Deviation	1	3
	Valid N	4	3

Appendix F: Questionnaire for team members in the English language

Dear Sir or Madam!

This research is part of my doctoral dissertation on the **"Role of Social Networks in Team Work"** and your team has been chosen to participate by your organisation.

The social networks of organisations and teams are becoming more and more important in the creation of a competitive edge through effective cooperation. The main purpose of this search is to identify informal social networks of organisational teams and measure the influence of the structure of personal and group relationships among team members on the team's business performance.

I would kindly ask you to fill out this questionnaire with a few short questions about your social network inside and outside your work team. In order to obtain the most reliable results, it is very important that you answer all the questions. The anonymity of data is guaranteed in accordance with the Standards of Scientific Research Work. This research is meant for scientific purposes only.

Thank you very much for your contribution!

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Demography

Your Name: _____

Gender: 1) Male   2) Female

Age: 1) under 25   2) 25–40   3) 40–55   4) more than 55

Educational level: 1) Elementary school   2) High school   3) Vocational school

               4) Bachelor (university degree)   5) Master's degree   6) PhD

What is your previous occupational organisational/from which organisation/company (occupation) did you come into this team?

_____

_____

For how long have you been working for this company (no. of months/years)?

_____

_____

For how long have you been working for this team (no. of months/years)?

_____

_____

Questions on Social Networks (intragroup)

Consider all situations in the past three months in which you cooperated with your colleagues in a formal way (task advice ties) and all situations in which you socialised with your colleagues outside work (going to an informal lunch, dinner, drinks..).

1. "How frequently did you go to this person for a task-related advice problem?" Please fill in the table using crosses (x).

	Never	Less than once a month	1 to 3 times a month	1 to 3 times a week	Daily

2. "How frequently did you go out with this person for social activities outside work (like after work) such as going out to an informal lunch, dinner or drinks?" Please fill in the table using crosses (x).

	Never	Less than once a month	1 to 3 times a month	1 to 3 times a week	Daily

3. "Why do you socialise inside your work team"? Is it for the social support, trust, political support, information, emotional support or some other reason? Please select one or several options and rank them according to their importance, from the **least important (1)** to the **most important (6).**

    a) Social support (associating outside the workplace, friendship relationship)
        _____ ____ (importance from 1 to 6)

    b) Trust
        _____ (importance from 1 to 6)

    c) Political support (support in promotion, career development, consultations in a decision-making process, support in conflict situations)
        _____ (importance from 1 to 6)

    d) Information (about work, other team members, organisation)
        _____(importance from 1 to 6)

    e) Emotional support (confidential issues, support in crisis situations)
        _____ (importance from 1 to 6)

    f) Other reason (please specify): _____

        _____

        _____ (importance from 1 to 6)

4. "Please tell us from whom in your team you get social support, trust, political support, information, emotional support and other support". Please fill in the table using crosses (x).

	Social support	Trust	Political support	Information	Emotional support	Other support

Questions on Social Networks (intergroup)

5. Please name up to ten people in your organisation but outside of your own work team to "**whom you have often turned to in the last 3 working months for work-related advice?"** Please also write from which department they come and which position they hold.

            Name   Department and position

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

6. Please name up to ten people in your organisation but outside of your own work team with whom you **"have been out with often (like after work) for social activities outside of work such as going out to an informal lunch or dinner".** Please also write from which department they come and which position they hold.

            Name   Department and position

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

7. "Why do you socialise outside your work team"? Is it for the social support, trust, political support, information, emotional support or some other reason? Please select one or several options and rank them according to their importance, from the **least important (1)** to the **most important (6).**

a) Social support (associating outside the workplace, friendship relationship)
    _____ _____ (importance from 1 to 6)

b) Trust
    _____ (importance from 1 to 6)

c) Political support (support in promotion, career development, consultations in a decision-making process, support in conflict situations)
    _____ (importance from 1 to 6)

d) Information (about work, other team members, organisation)
    _____(importance from 1 to 6)

e) Emotional support (confidential issues, support in crisis situations)
    _____ (importance from 1 to 6)

f) Other reason (please specify): _____

    _____

    _____(importance from 1 to 6)

Level of self-management of the work team

On a five-point scale please evaluate the level of self-management of your team. How much do you agree/disagree with the statement that your team:

1. **is eager to take on the responsibilities traditionally reserved for management**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

2. **fully accepts making more and more decisions such as planning and scheduling work**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

3. **fully supports taking on the responsibility for production/services-related concerns**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

Evaluation of the team's effectiveness

On a five-point scale please assess your **team's productivity.** How much do you agree/disagree with the statement that your team:

1. **meets or exceeds team goals**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

2. **completes team tasks on time**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

3. **makes sure that products and services meet or exceed agreed standards**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

4. **responds quickly when problems come up**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

5. **is a productive team**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

6. **successfully overcomes problems that slow work down**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

On a five-point scale please assess your **team's cooperation.** How much do you agree/disagree with the statement that members of your team:

7. **are willing to share information with other team members about the work**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

8. **cooperate to get the work done**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

9. **enhance the communication among people working on the same topic/issue/problem**
   a) strongly agree
   b) agree
   c) neither agree neither disagree
   d) disagree
   e) strongly disagree

On a five-point scale please assess your **team's empowerment.** How much do you agree/disagree with the statement that your team:

10. **has confidence in itself**
    a) strongly agree
    b) agree
    c) neither agree neither disagree
    d) disagree
    e) strongly disagree

11. **can select different ways to do the team's work**
    a) strongly agree
    b) agree
    c) neither agree neither disagree
    d) disagree
    e) strongly disagree

12. **believes that that team's work is valuable and makes a difference to the organisation**
    a) strongly agree
    b) agree
    c) neither agree neither disagree
    d) disagree
    e) strongly disagree

If you could choose, would you participate in this team?

    a) YES   b) NO

Appendix G: Questionnaire for team members in the Slovenian language

Pozdravljeni!

Vaš tim je bil izbran za sodelovanje v doktorski raziskavi "Vloga socialnih omrežij pri timskem delu".

Socialna omrežja organizacij in timov postajajo v ustvarjanju konkurenčne prednosti skozi učinkovito sodelovanje vse bolj prepoznavna. Glavni namen raziskave je ugotoviti vpliv neformalnih socialnih omrežij na poslovno uspešnost organizacijskih timov.

Vljudno Vas prosim, da izpolnite kratek vprašalnik o socialnem omrežju vašega tima. Za zanesljivost rezultatov je pomembno, da odgovorite na vsa vprašanja. Anonimnost podatkov je zagotovljena v skladu s standardi znanstveno-raziskovalnega dela. Podatki bodo uporabljeni izključno v raziskovalne namene.

Najlepša hvala za sodelovanje!

Barbara Lužar

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Demografski podatki

Ime: _____

Spol:　1) moški　　2) ženski

Starost :　1) pod 25 let　　2) 25-40 let　　3) 40-55 let　　4) več kot 55 let

Vaš Poklic/profesija: _____

Vaša izobrazbena stopnja:　1) OŠ　　2) Srednja šola　　3) Poklicna šola

4) Diploma　　　5) Magisterij　　　6) Doktorat

Kakšno je vaše profesionalno ozadje/iz katerega podjetja (dejavnosti) ste prišli v sedanji tim?

_____

Kako dolgo že delate za sedanje podjetje?

_____

Kako dolgo ste že v sedanjem timu?

_____

Vprašanja o socialnem omrežju (znotraj tima)

Spomnite se vseh situacij v zadnjih treh mesecih, ko ste si s sodelavci izmenjali nasvet v okviru službe in ko ste se družili izven delovnega časa (neformalna večerja, pijača, športne/družabne aktivnosti).

1. **Kako pogosto ste se v službi obrnili na svoje sodelavce po nasvet glede dela?**
   Prosim izpolnite tabelo s križci (x)

	nikoli	manj kot 1x na mesec	1-3x na mesec	1- 3x na teden	Dnevno

2. **Kako pogosto ste se s sodelavci družili po službi (neformalno kosilo, večerja, pijača oz. športne/družabne aktivnosti)**? Prosim izpolnite tabelo s križci (x)

	nikoli	manj kot 1x na mesec	1-3x na mesec	1- 3x na teden	Dnevno

3. "Kako pogosto so se vaši sodelavci po službeni nasvet obrnili na Vas?
Prosim izpolnite tabelo s križci(x)

	nikoli	manj kot 1x na mesec	1-3x na mesec	1- 3x na teden	dnevno

4. "Zakaj se s sodelavci družite po službi? (socialna podpora, zaupanje, politična podpora, informacija, emocionalna podpora, drugo) . Prosimo rangirajte po lestvici od **1 (najmanj pomembno)** do **6 (najbolj pomembno).**

g) Socialna podpora (druženje izven službe, prijateljstvo)
   _____

h) Zaupanje
   _____

i) Politična podpora (podpora pri napredovanju, karieri, posvetovanju, odločanju, podpora v konfliktnih situacijah)
   _____

j) Informacija (glede dela, sodelavcev, podjetja/organizacije)
   _____

k) Čustvena podpora (podpora v kriznih situacijah)
   _____

l) Drugi razlogi (prosim opišite)
   _____

5. "Kateri sodelavci v timu Vam nudijo socialno podporo, zaupanje, politično podporo, informacije, čustveno podporo in drugo podporo?"

Prosim izpolnite tabelo s križci(x)

	socialna podpora	Zaupanje	politična podpora	informacija	čustvena podpora	druga podpora

Vprašanja o socialnem omrežju (zunaj tima)

6. Prosim naštejte **do 10 oseb** v vašem podjetju/organizaciji izven vašega tima "**na katere ste se v zadnjih 3 mesecih obrnili po službeni nasvet".** Napišite tudi iz katerega oddelka prihajajo in kateri položaj zasedajo.

	Ime	Oddelek/Položaj

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

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7. Prosim naštejte **do 10 oseb** v vašem podjetju/organizaciji izven vašega tima "**s katerimi ste se večkrat družili po službi npr.na neformalnem kosilu, večerji, športnih/družabnih aktivnostih**". Napišite tudi iz katerega oddelka prihajajo in kateri položaj zasedajo.

        Ime   Oddelek/Položaj

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

8. " Zakaj se družite izven vašega tima?" (socialna podpora, zaupanje, politična podpora, informacija, emocionalna podpora, drugo). Prosimo rangirajte po lestvici od **1 (najmanj pomembno)** do **6 (najbolj pomembno).**

    a) Socialna podpora (druženje izven službe, prijateljstvo)

        _____

    b) Zaupanje

        _____

    c) Politična podpora (podpora pri napredovanju, karieri, posvetovanju, odločanju, podpora v konfliktnih situacijah)

        _____

d) Informacija (glede dela, sodelavcev, podjetja/organizacije)

   _____

e) Čustvena podpora (podpora v kriznih situacijah)

   _____

f) Drugi razlogi (prosim opišite)

   _____

Stopnja samostojnosti tima

Na 5-stopenjski lestvici ocenite stopnjo samostojnosti vašega tima. Koliko se strinjate/ne strinjate z naslednjimi trditvami, da je vaš tim:

4. **pripravljen sprejeti večjo odgovornost za delo in uspeh, ki je tradicionalno v domeni menedžmenta?**
   f) močno se strinjam
   g) strinjam se
   h) niti se strinjam niti se ne strinjam
   i) ne strinjam se
   j) močno se ne strinjam

5. **sprejema vse več odločitev glede načrtovanja in razporeditve dela**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

3. **podpira prevzemanje odgovornosti za produkte/storitve**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

Evalvacija učinkovitosti tima

Na 5-stopenjski lestvici ocenite **stopnjo produktivnosti** vašega tima. Koliko se strinjate/ne strinjate z naslednjimi trditvami, da vaš tim:

1. **dosega oz. presega cilje tima**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

2. **opravi delo pravočasno**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

3. **poskrbi, da so izdelki in storitve v skladu s standardi**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

4. **se hitro odzove na probleme**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

5. **tim je produktiven tim**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

6. **tim uspešno presega ovire pri delu**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

Na 5-stopenjski lestvici ocenite **stopnjo sodelovanja** vašega tima. Koliko se strinjate/ne strinjate z naslednjimi trditvami, da so člani vašega tima:

7. **pripravljeni deliti informacije glede dela s sodelavci**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

8. **sodelujejo, da se delo opravi**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

9. **spodbujajo komunikacijo med ljudmi, ki delajo na istem področju/temi/problemu**
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

Na 5-stopenjski lestvici ocenite **stopnjo moči** vašega tima. Koliko se strinjate/ne strinjate z naslednjimi trditvami, da vaš tima:

10. **tim zaupa vase** (samozavest)
    a) močno se strinjam
    b) strinjam se
    c) niti se strinjam niti se ne strinjam
    d) ne strinjam se
    e) močno se ne strinjam

11. tim si lahko sam izbere svoj način dela
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

12. tim verjame, da je delo tima koristno in prispeva svoj delež k uspehu organizacije
   a) močno se strinjam
   b) strinjam se
   c) niti se strinjam niti se ne strinjam
   d) ne strinjam se
   e) močno se ne strinjam

Če bi lahko izbirali, ali bi sodelovali v sedanjem timu?

   a) DA   b) NE

Vloga socialnih omrežij pri timskem delu (daljši povzetek v slovenskem jeziku)

V doktorski disertaciji obravnavamo koncept timskega dela in analiziramo dejavnike za njihovo uspešno delovanje. Timsko delo v organizacijski praksi ni nov pojav, saj je že več kot 50 let predmet analize v sociologiji organizacij in sociologije dela. Proučevanje timov in timskega dela je danes še posebej zanimivo, saj se "skoraj vse pomembne odločitve sprejmejo v timih, bodisi neposredno ali preko tima, ki pretvori posamezne odločitve v dejanja" (Senge 1990, 236). Zato je proučevanje opisane tematike in raziskovalnega vprašanja kaj so dejavniki uspešnega timskega dela še vedno zelo aktualno. V primerjavi s predhodnimi študijami o delovanju timov je danes v ospredju predvsem pomen socialnih povezav med člani tima, ki igrajo pomembno vlogo pri oblikovanju dinamike in uspeha timskega dela. V disertaciji nas je zato še posebej zanima vloga socialnih omrežij pri timskem delu.

Številni avtorji (Ancona 1990; Baldwin 1997; Hansen 1999; Brown in Miller 2000; Reagans in Zuckerman 2001; Sparrowe in drugi 2001; Cummings in Cross 2003; Oh in drugi 2004; Henttonen in drugi 2010) so se v svojih raziskavah o vplivu socialnih omrežij na uspešnost timov osredotočili na različne mere socialnih omrežij (usredinjenost, moč vezi, gostota vezi, raznovrstnost omrežja, vezi zunaj in znotraj tima). Rezultati teh študij so pokazali, da številne mere omrežij vplivajo na uspešnost timov.

Idejo o usredinjenosti komunikacijskih struktur je leta 1948 predstavil Bavelas. Komunikacijska omrežja, ki jih je proučeval, so se razlikovala predvsem v tem, kako so komunikacijski kanali povezovali različne položaje v omrežju. Člani timov v popolnoma povezanem omrežju so bili v splošnem najbolj zadovoljni, kljub temu je proces sprejemanja odločitev v teh timih potekal počasi. Po drugi strani pa centralizirana struktura pozitivno vpliva na uspešnost pri sprejemanju odločitev. Sparrowe in drugi (2001) so ugotovili, da decentralizirana omrežja povečujejo medsebojno odvisnost med člani tima, kar spodbuja sodelovanje, medtem ko so v centraliziranih omrežjih vezi zgoščene le okoli manjšega števila posameznikov. Manjša soodvisnost vodi v manj sodelovanja, kar negativno vpliva na uspešnost tima.

Tudi moč vezi je pomembna značilnost omrežij, ki prispeva k uspešnemu delovanju timov. Močne vezi posameznike tesneje povežejo in tako ustvarijo visoko stopnjo medsebojnega razumevanja, razvijejo zaupanje in prijateljske vezi med posamezniki (Homans 1950) in so zanesljiv kanal komunikacije (Coleman 1988). Po drugi strani šibke vezi povečujejo priložnosti za posameznike (kot je npr. karierno napredovanje) in omogočajo dostop do novega znanja (Granovetter 1979). Timi, za katere so značilne močne vezi, so kohezivni timi. Študije o produktivnosti skupin, so pokazale, da je produktivnost kohezivnih skupin višja, prav tako je za te skupine značilno večje spoštovanje do vodje (Blau in Scott 1963). Pozitiven vpliv kohezivnosti na delovanje omrežij so predstavili številni avtorji, še posebej pri vzpostavljanju zaupanja v omrežjih (Granovetter 1973; Coleman 1990). Kljub temu, lahko povezanost postane past (Smith-Doerr in Powell 2003), kadar informacije potekajo samo med omejenim številom posameznikov.

Kadar govorimo o vplivu socialnih omrežij na uspešnosti timov, moramo upoštevati tudi raznolikost socialnih omrežij timov. Ziherl in drugi (2006) so raznolikost raziskovalnih timov pojmovali kot velikost omrežja tima, profesionalno ozadje članov tima in število vezi, ki jih imajo člani zunaj meja svojega tima. Vezi zunaj omrežja ali tima, kar imenujemo heterogenost omrežja, ima vpliv na uspešnost timov (Reagans in Zuckerman 2001). Gostota teh vezi je pozitivno povezana z učinkovitostjo tima in je še posebej pomembna v primeru, da so člani močno povezani znotraj tima. Ta ugotovitev sovpada s pristopom "strukturnih lukenj" (Burt 1992), ki predpostavlja, da je za tim pomembna premostitev strukturnih lukenj. Akterji, ki povezujejo nepovezane skupine dostopajo do širše palete idej in priložnosti, kot tisti, ki so omejeni le na eno (Burt 1992).

Timi so socialne mreže neformalnih odnosov med posamezniki in se razlikujejo glede na vrsto socialne vezi. V disertaciji smo proučili dve različni vrsti neformalnih socialnih povezav, ki se razlikujeta glede na vsebino: posvetovanje, kjer vezi med posamezniki služijo za dajanje in prejemanje ene vsebine povezav, to je nasvet in druženje, kjer posamezniki izmenjajo različne vire. Podolny in Baron (1997) razumeta vezi posvetovanja kot instrumentalne vezi, ki omogočajo dostopanje do informacij, med tem ko so vezi druženja bolj ekspresivne in služijo za prenos različnih virov, kot je družbena opora, prijateljstvo, politična podpora, informacije,

emocionalna opora (Oh in drugi 2004). Kljub temu, da socialne vezi tako kot vezi posvetovanja omogočajo pretok informacij, moramo obe vrsti vezi nujno proučevati ločeno, saj se lahko njuni vzorci povezav močno razlikujejo.

V disertaciji timsko delo pojmujemo kot "delo, ki ga opravi samostojna skupina ljudi, ki se dogovori o sodelovanju, z namenom doseganja skupnega cilja in dlje časa deluje v medsebojnih interakcijah (lastna definicija). Za razliko od formalnih struktur poročanja, neformalne socialne povezave predstavljajo ad hoc odnose, ki jih člani organizacije sami tvorijo in z njimi tudi sami upravljajo (Cross in Parker 2004). "Če je formalna organizacija okostje družbe, je neformalna organizacija centralni živčni sistem, ki potiska kolektivne miselne procese, dejanja in reakcije poslovnih enot...Njegove zapletene mreže socialnih vezi se skozi čas utrdijo v presenetljivo stabilna omrežja, kadarkoli zaposleni med seboj komunicirajo. Visoko prilagodljiva, neformalna omrežja se premikajo diagonalno in eliptično, in preskakujejo posamezne funkcije, da svoje delo opravijo "(Krackhardt in Hanson 1993, 104).

Glavno raziskovalno vprašanje v disertaciji je kaj so dejavniki uspešnega timskega dela. Z namenom razlage uspeha timov s pomočjo različnih vzorcev socialnih omrežij in ob upoštevanju demografskih in organizacijskih značilnosti timov, smo uporabili tako že uveljavljene teoretične in metodološke pristope kot tudi novejše koncepte, ki se vse bolj uveljavljajo kot učinkoviti instrumenti sociološke analize-analizo socialnih omrežij. Da bi odgovorili na zastavljeno raziskovalno vprašanje, smo analizirali time s pomočjo treh vidikov socialnih omrežij - povezanosti navznoter, povezanosti navzven in socialnega omrežja vodij, kar ponazarjajo naslednja vprašanja:

1. Kateri vzorec strukture povezav v omrežjih posvetovanja in druženja prispeva k večji uspešnosti timov?

2. Ali je za uspešne time značilna večja raznolikost omrežja?

3. Kako se socialna omrežja vodij razlikujejo glede na vrsto vezi (posvetovanje; druženje) in glede na učinkovitost tima?

V prvem delu doktorske disertacije smo podali celovit pregled prvih analiz timov in timskega dela z vidika organizacijskih teorij, poudarili vlogo neformalnih socialnih omrežij v organizacijah, definirali time z vidika socialnih omrežij, predstavili raziskave o socialnih omrežjih vodij timov in opisali temeljna načela socialnih omrežij kot nov pristop k razvoju človeških virov. Nato sledi pregled preteklih raziskav o socialnih omrežjih timov in vodij timov in predstavitev hipotez o vplivu različnih vzorcev povezav socialnih omrežij timov in vodij timov na uspešnost timov. V drugem delu doktorske disertacije smo opisali raziskovalni pristop in metodologijo, vključno z merjenjem socialnih omrežij, zbiranjem podatkov, opisom vzorca, postopka analize in problemom manjkajočih podatkov. V empiričnem delu smo analizirali demografske in organizacijske značilnosti članov timov in socialnih omrežij timov in vodij timov z uporabo različnih metod analize podatkov (kvalitativne in kvantitativne metode, vključno z metodo analize socialnih omrežij in statistične bivariatne in multivariatne analize). Vsebine vezi in viri, ki se izmenjujejo prek neformalnih socialnih vezi, so opisani v posebnem poglavju. V analizo smo vključili posebej slovenske in finske time, prav tako smo vodjem timov in njihovim socialnim omrežjem posvetili samostojno poglavje. V zadnjem delu smo predstavili splošne ugotovitve iz naše raziskave o vlogi socialnih omrežij pri timskem delu in preverili ali predpostavljene hipoteze o socialnih omrežjih timov in vodij pojasnjujejo faktorje uspešnega timskega dela. V zaključku podamo tudi značilnosti uspešnih slovenskih in finskih timov in njihovih vodij. Disertacijo zaključimo z diskusijo in razlago znanstvenega prispevka doktorske disertacije za organizacijsko teorijo na področju socialnih omrežih in manjših skupin.

Metodološko ozadje raziskave

V empiričnem delu naloge smo želeli preveriti pojasnjevalno moč socialnih omrežij, kot enega izmed novejših pristopov k analizi timov. V vzorec raziskave smo zajeli 26 timov v 8 slovenskih organizacijah in 8 finskih timov v 2 organizacijah v letih 2010-2012. Podatke smo zbrali z uporabo sociometrične metode, ki je ena izmed najbolj uporabljenih metod za zbiranje podatkov o socialnih omrežjih, in s katero smo zbrali podatke o značilnostih vezi, ki jih imajo člani tima z drugimi člani tima ali z člani zunaj tima. V ta namen smo oblikovali vprašalnik, ki smo ga respondentom posredovali v obliki spletne raziskave ali osebno na terenu. Poleg tega smo v večini organizacij (več kot 84%) opravili tudi osebne intervjuje z

vodji kadrovskih služb. Z njimi smo pridobili informacije o organizacijskem kontekstu, v katerega so timi vpeti in o naravi dela timov. V raziskavi smo uporabili kombinacijo kvalitativnih in kvantitativnih metod. Pri proučevanju slovenskih timov smo se osredotočili predvsem na ugotavljanje vpliva socialnih omrežij na delovanje timov z vidika njihove uspešnosti. Ta vpliv smo skušali tudi statistično preveriti. Ocena uspešnosti je bila podana s strani članov timov in njihovih vodij. Zaradi nizke stopnje variabilnosti v oceni učinkovitosti, smo time razdelili v skupine glede na povprečno oceno uspešnosti. Najprej smo time razdelili v dve skupini, bolj in manj uspešne time, in preverjali vpliv socialnih omrežij in demografskih in organizacijskih značilnosti na uspeh timov. To smo poimenovali analiza 1. Pojasnjevalna moč socialnih omrežij je bila šibkejša od organizacijskih značilnosti timov, predvsem velikosti tima. V drugem koraku smo razdelili time v tri enako velike skupine glede na povprečno oceno učinkovitosti, najbolj uspešne, srednje uspešne in najmanj uspešne time, kar smo poimenovali analiza 2. Nato smo preverili pojasnjevalni vpliv socialnih omrežij in demografskih in organizacijskih značilnosti na uspeh timov. Rezultati so pokazali, da imajo socialna omrežja, konkretno posvetovalna omrežja, v bolj kontrastnih timih močnejši vpliv na učinkovitost timov kot organizacijske značilnosti, razen staža v timu, ki prav tako statistično značilno pojasnjuje uspešno delovanje timov. V primeru slovenskih vodij timov, finskih timov in njihovih vodij pa smo uporabili deskriptivni pristop k analizi in primerjali socialna omrežja timov in njihovih vodij glede na uspešnost timov.

Preverjanje hipotez

Na podlagi teoretskih predpostavk in zastavljenih raziskovalnih vprašanj smo oblikovali sedem ključnih hipotez, ki so bile podlaga za empirično proučevanje povezave med socialnim omrežjem in uspešnostjo timskega dela.

S prvo hipotezo (H1a) smo predpostavljali, da je visoka stopnja kohezivnosti v omrežju posvetovanja pozitivno povezana z uspešnostjo tima. S primerjavo treh različnih ravni uspešnosti slovenskih timov (visoka, zmerna in nizka) smo pokazali, da je kohezivnost najbolj statistično značilen pojasnjevalni dejavnik uspešnosti tima, tudi ko kontroliramo po velikosti tima. Rezultati analize potrjujejo našo hipotezo H1a. Kohezivni timi, kjer so člani timov med seboj povezani z močnimi vezmi, so bolj uspešni. Pokazal se je tudi šibek, vendar statistično

značilen in pozitiven vpliv staža v timu (team tenure) na uspešnost tima. Timi katerih člani so dalj časa skupaj so bolj učinkoviti. Vpliv stopnje kohezivnosti na uspešnost tima smo preverili tudi v omrežju druženja. Druga hipoteza (H1b) tako predpostavlja, da je visoka stopnja kohezivnosti vezi v omrežju druženja pozitivno povezana z uspešnostjo tima. Rezultati naše raziskave so pokazali, da kohezivnost povezav v omrežju druženja, ko kontroliramo velikost tima, ni statistično značilno povezana z uspešnostjo slovenskih timov. Za uspešne finske time iz naše raziskave pa je značilna nizka stopnja kohezivnosti v omrežju druženja in šibke povezave med njihovimi člani in zato hipoteze H1b ne moremo potrditi.

S hipotezama H2a in H2b smo skušali preveriti, ali je nizka stopnja usredinjenosti omrežja posvetovanja in omrežja druženja pozitivno povezana z uspešnostjo tima. S primerjavo dveh ravni uspešnosti timov (bolj in manj) smo ugotovili, da stopnja usredinjenosti, ko kontroliramo velikost tima, nima statistično značilnega vpliva na uspešnost slovenskih timov in ne finskih timov (korelacije), zato hipotez H2a in H2b ne moremo potrditi.

S hipotezo H3 smo preverjali raznolikost timov in njen vpliv na uspešnost timov. Koncept raznolikosti timov smo operacionalizirali z mero velikosti tima in vezmi, ki jih imajo člani tima z drugimi timi in drugimi vodji timov. Rezultati primerjalne analize med bolj in manj uspešnimi skupinami timov so pokazali, da so vezi zunaj tima najbolj pomembna mera raznolikosti timov, tako v slovenskih, kot tudi finskih timih. Bolj uspešni finski timi imajo več vezi v omrežju druženja z drugimi timi in vodji timov, medtem ko imajo bolj uspešni slovenski timi več vezi v omrežju posvetovanja z drugimi vodji in več vezi v omrežju druženja z drugimi timi in vodji timov v primerjavi z manj uspešnimi timi. Hipotezo lahko delno potrdimo. Uspešni timi imajo večjo stopnjo raznolikosti pri vzpostavljenih vezeh zunaj meja tima in povezujejo tim s širšim organizacijskim kontekstom.

V hipotezah H4a in H4b smo se osredotočili na omrežja vodij timov in predpostavljali, da so timi z vodji, ki zavzemajo prestižni položaj v omrežju posvetovanja, bolj uspešni in da so timi z vodji, ki zavzemajo prestižni položaj v omrežju druženja, prav tako bolj uspešni. Rezultati analiz so pokazali, da vodje v najmanj uspešnih timih, kot tudi v najbolj uspešnih timih, zavzemajo prestižni položaj v timu, je pa majhna razlika v stopnji prestiža v korist vodij bolj uspešnih timov. Zato lahko hipotezi H4a in H4b potrdimo. Vodje, ki zavzemajo središčni

položaj v omrežju posvetovanja, svojo formalno moč dopolnjujejo z neformalno močjo in tako dostopajo do različnih podatkov in virov, kar ima pozitiven vpliv na uspešnost tima. Prestižno pozicionirani vodje timov so značilni za uspešne time. Vodje, ki zavzemajo središčni položaj v omrežju druženja imajo pregled nad socialno strukturo tima, kar jim omogoča boljše sprejemanje odločitev.

Značilnosti slovenskih timov in njihovih vodij

S podrobno analizo slovenskih timov smo ugotovili naslednje značilnosti. Večina članov timov, vključenih v raziskavo so moški, stari med 40-55 let, z visokošolsko izobrazbo. V povprečju imajo timi 9 članov in eno tretjino članov z raznolikim profesionalnim ozadjem. Njihova socialna omrežja kažejo, da so timi visoko kohezivni, z decentralizirano strukturo v omrežju posvetovanja in nižjim deležem prekrivanja med omrežjem posvetovanja in omrežjem druženja (multiplexity). Člani timov imajo med seboj vzpostavljene močne vezi in več vezi s člani drugih timov, kot pa z vodji drugih timov. Njihova omrežja druženja so manj kohezivna in bolj centralizirana kot pa omrežja posvetovanja. Člani timov se med seboj družijo po službi manj kot enkrat na mesec in se bolj družijo s člani drugih timov, kot pa z vodji drugih timov. Kljub temu so člani timov pri vzpostavljanju vezi zunaj tima bolj aktivni v omrežju posvetovanja.

Ko smo primerjali socialna omrežja slovenskih timov in njihovo uspešnost, smo ugotovili, da so najbolj uspešni slovenski timi po velikosti manjši in imajo manj članov z raznolikim profesionalnim ozadjem, člani tima pa imajo daljši staž v timu v primerjavi z najmanj uspešni timi. Poleg tega so omrežja posvetovanja najbolj uspešnih timov bolj kohezivna in manj centralizirana, z nizkim deležem multipleksnih vezi in visoko stopnjo moči vezi. Njihova omrežja druženja so prav tako bolj kohezivna in manj centralizirana kot omrežja najmanj uspešnih timov. Razlik med najbolj in najmanj uspešnimi timi pri pogostosti druženja ni, prevladuje druženje manj kot enkrat na mesec, medtem ko so razlike opazne pri druženju in posvetovanju zunaj meja timov v prid uspešnih timov. Bolj uspešni timi imajo več posvetovalnih vezi z vodji drugih timov in več družabnih povezav s člani in vodji drugih timov v primerjavi z manj uspešnimi timi. Razlike so se pokazale tudi v primerjavi različnih vrst timov. Delovni timi so bolj uspešni, kot projektni timi in imajo višjo stopnjo samoupravljanja.

Delovni timi so tudi manjši in imajo manj članov z raznolikim profesionalnim ozadjem, njihova omrežja posvetovanja in druženja so bolj kohezivna in manj usredinjena. Člani projektnih timov pa imajo bolj aktivne povezave s člani drugih timov, na kar lahko delno vpliva tudi velikost projektih timov.

Povprečni vodja slovenskega tima, vključen v raziskavo, je moški, star med 40-55 let, z visokošolsko izobrazbo. Vodje imajo daljši organizacijski staž od staža v timu. V omrežju posvetovanja zavzemajo prestižni položaj in le redko delujejo kot povezovalni člen med člani tima, za razliko od ženskih vodij timov. Vodja tima ima vzpostavljene močne vezi s člani tima, ki se nanje obrnejo po nasvet 1-3 krat na teden. Prisotnost triadnih povezav (Simmelian ties) pri vodjih timov je srednje nizka, kar pomeni, da so vodje pri samostojnemu sprejemanju svojih odločitev manj omejeni s strukturo omrežja tima. Vodje timov imajo srednjo stopnjo multipleksnih vezi in le ena tretjina jih ima raznoliko profesionalno ozadje. V večji meri se posvetujejo s člani drugih timov kot pa z vodji drugih timov. V omrežju posvetovanja niso najbolj centralni, se pa družijo s člani tima, ki zavzemajo centralni položaj. Zunaj tima se v večji meri družijo s člani drugih timov kot pa z vodji drugih timov.

Z vidika uspešnosti slovenskih timov je za vodje najbolj uspešnih timov značilen daljši staž v organizaciji in krajši v timu in raznoliko profesionalno ozadje. Vodje slovenskih timov se razlikujejo tudi po stopnji formalne izobrazbe; vodje najbolj uspešnih slovenskih timov imajo univerzitetno izobrazbo, vodje najmanj uspešnih timov pa magisterij ali doktorat. Vodje najbolj uspešnih timov zavzemajo v omrežju posvetovanja bolj prestižni položaj, s člani tima so povezani z močnejšimi vezmi in so v primerjavi z vodji najmanj uspešnih timov manj vpeti v triadne povezave (Simmelian ties). Poleg tega imajo vodje najbolj uspešnih timov nižjo stopnjo multipleksnosti vezi, enako število zunanjih vezi z drugimi timi in manj posvetovalnih vezi z vodji drugih timov v primerjavi z vodji najmanj uspešnih timov. V omrežju druženja vodje najbolj uspešnih timov prav tako zavzemajo centralni položaj, a imajo šibke vezi druženja z ostalimi člani tima, podobno kot vodje manj uspešnih timov. Vodje najbolj uspešnih timov imajo več triadnih povezav (Simmelian ties) in manj zunanjih vezi s člani drugih timov in vodji drugih timov kot vodje najmanj uspešnih timov. Vodje delovnih timov vodijo bolj uspešne time, ki imajo visoko stopnjo samoupravljanja in več članov, ki prihajajo

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iz drugih organizacij. Vodje delovnih timov imajo s člani tima vzpostavljene močne vezi posvetovanja in zavzemajo bolj središčni položaj v omrežju. Poleg tega so manj vpeti v triadne povezave (Simmelian ties). V omrežju druženja, vodje delovnih timov prav tako zavzemajo bolj središčni položaj kot vodje projektnih timov, vendar so hkrati bolj vpeti v triadne povezave (Simmelian ties) in imajo vzpostavljenih več družabnih vezi s člani drugih timov in vodji drugih timov.

Značilnosti finskih timov in njihovih vodij

Analiza finskih timov je pokazala na naslednje značilnosti. Večina članov timov, vključenih v raziskavo so ženske, stare med 40-55 let, z visoko izobrazbo (magisterij ali doktorat). V povprečju imajo timi 8 članov, člani imajo daljši organizacijski staž od staža v timu in polovica članov ima raznoliko profesionalno ozadje. Njihova omrežja druženja kažejo, da so timi nizko kohezivni, s srednje nizko stopnjo usredinjenosti. Člani timov imajo med seboj vzpostavljene šibke vezi in več zunanjih vezi s člani drugih timov kot pa z vodji drugih timov.

Različno uspešni finski timi so si med seboj podobni glede na njihovo velikost in število članov z raznolikim profesionalnim ozadjem, se pa razlikujejo v povprečnem stažu v timu. Člani bolj uspešnih timov imajo krajši staž v timu. Bolj uspešni timi imajo manj kohezivno in bolj usredinjeno omrežje druženja, več vezi z drugimi timi in vodji drugih timov in višjo stopnjo avtonomije. Omrežja finskih timov se razlikujejo tudi glede na vrsto tima. Delovni timi so v povprečju manj uspešni kot projektni timi, se pa med seboj ne razlikujejo glede na stopnjo avtonomije. Delovni timi so bolj kohezivni in imajo več članov in več vzpostavljenih vezi z drugimi timi in njihovimi vodji. Člani delovnih timov imajo daljši organizacijski staž in so med seboj povezani z bolj močnimi vezmi druženja, kot člani projektnih timov, se pa še vedno družijo manj pogosto, manj kot enkrat na mesec.

Vsi finski timi, vključeni v raziskavo imajo žensko vodjo, vodje so večinoma stare med 40-55 let in imajo visoko stopnjo izobrazbe (magisterij ali doktorat). Vodje so v svoji organizaciji zaposlene dlje, kot so vodje tima. V omrežju posvetovanja zavzemajo središčni položaj in se posvetujejo z vsemi člani tima, medtem ko se družijo le s polovico članov tima. S člani tima imajo vzpostavljene šibke posvetovalne vezi, kar pomeni, da svetujejo oz. se posvetujejo le

1-3 krat na mesec. V omrežju druženja imajo vodje timov nizko stopnjo vpetosti v triadne povezave, v omrežju posvetovanja pa imajo bolj vzpostavljene vezi z člani drugih timov kot pa z vodji drugih timov. Manj kot polovica vodij finskih timov ima raznoliko profesionalno ozadje.

Z vidika uspešnosti finskih timov so za vodje bolj uspešnih timov značilni krajši organizacijski staž in staž v timu, a bolj raznoliko profesionalno ozadje. Vodje bolj uspešnih finskih timov so v primerjavi z vodji manj uspešnih timov mlajše (25-40 let) in vodijo bolj avtonomne time, ki so projektne narave. V omrežju posvetovanja vodje bolj uspešnih timov zavzemajo bolj središčen položaj, kar pomeni, da se bolj posvetujejo s člani tima, medtem ko v omrežju druženja zavzemajo manj središčni položaj kot pa vodje manj uspešnih timov. Strukturno so manj vpeti v triadne povezave (Simmelian ties) in imajo več vzpostavljenih vezi s člani drugih timov in z vodji drugih timov kot vodje manj uspešnih timov. Vodje projektnih timov imajo bolj raznoliko profesionalno ozadje in močnejše vezi druženja s člani svojega tima, so pa manj centralni in manj vpeti v triadne povezave (Simmelian ties).

Uspešni slovenski in finski timi se razlikujejo tako po organizacijskih značilnostih kot po vzorcih svojih socialnih omrežij. Medtem ko je za slovenske time značilna visoka stopnja kohezivnosti, nizka stopnja usredinjenosti in daljši staž članov v timu, je za finske time značilno nasprotno; nižja kohezivnost in višja usredinjenost omrežja in krajši staž v timu. Tudi omrežja vodij uspešnih slovenskih in finskih timov se razlikujejo. Vodje uspešnih slovenskih in finskih timov imajo sicer oboji prestižni položaj v timu in šibke vezi druženja znotraj tima, vendar imajo vodje finskih timov več povezav navzven, s člani in vodji drugih timov. In čeprav so socialna omrežja vodij uspešnih slovenskih in finskih timov različna, oboji vodijo učinkovite time. Na podlagi naših rezultatov lahko rečemo, da imajo vodje v timu pomembno nalogo in lahko pripomorejo k večjemu uspehu svojega tima na način, da delujejo kot socialni arhitekti (Bennis, 1976). To pomeni, da razvijajo svoja osebna omrežja, spodbujajo socialna omrežja svojega tima in zagotovijo svojim članom vso podporo in vire, ki prispevajo k različnim kvalitetam uspešnega timskega dela.

Povezave med člani tima pogosto služijo za prenos različnih vrst virov in podpore, zato nas je v raziskavi, poleg strukture socialnih omrežij timov in njihovih vodij, zanimala tudi vsebina povezav. Rezultati naše analize so pokazali, da člani uspešnih slovenskih timov v primerjavi s člani uspešnih finskih timov v omrežju druženja izmenjujejo različne vire. Člani najbolj uspešnih slovenskih timov se družijo predvsem zaradi nudenja socialne opore, zaupanja in informacij, medtem ko se člani najmanj uspešnih slovenskih timov družijo predvsem zaradi socialne opore in informacij. Za vezi s člani drugih timov pa so značilne veliko bolj raznolike vsebine, od socialne opore, zaupanja, emocionalne opore in socialne opore. Člani najmanj uspešnih timov pa si s člani drugih timov nudijo predvsem socialno oporo in informacije. Vodje najbolj uspešnih slovenskih timov drugim članom timov nudijo različno vrsto podpore, od informacij, politične podpore, zaupanja in socialne opore, medtem ko vodje najmanj uspešnih timov članom timov nudijo predvsem informacije. Na drugi strani pa člani najbolj uspešnih finskih timov v omrežju druženja nudijo predvsem informacije, medtem ko se člani najmanj uspešnih timov družijo predvsem zaradi zaupanja. S člani drugih timov pa člani najbolj uspešnih finskih timov izmenjujejo veliko bolj raznolike vsebine, od politične podpore, socialne opore, zaupanja in kombinacije politične podpore, socialne opore in informacij. Na drugi strani pa se člani manj uspešnih finskih timov družijo s člani drugih timov predvsem zaradi socialne opore. Vodje uspešnih timov članom nudijo informacije in politično podporo.

Znanstveni prispevek doktorske disertacije

Doktorska disertacija ima namen prispevati k razvoju področja proučevanja majhnih skupin in socialnih omrežij:

1. V raziskavo o socialnih omrežjih timov smo vključili dve različni vrsti neformalnih socialnih vezi, vezi posvetovanja in vezi druženja in tako proučili povezavo med kohezivnostjo omrežja in uspešnostjo tima v različnih kontekstih povezav. Disertacija nadgrajuje dosedanje raziskave na področju socialnih omrežij timov, ki so se osredotočale predvsem na eno izmed vezi v neformalnem socialnem omrežju (Baldwin in drugi 1997; Reagans in Zuckerman 2001; Oh in drugi 2004; Henttonen in drugi 2010).

2.   Proučili smo različne vsebine, ki se izmenjujejo v omrežju druženja med člani timov. S tem smo razvili bolj dinamični vpogled v socialna omrežja timov in ugotovili, katere vrste vezi služijo za določene vrste virov, kot so predlagali Mehra in drugi (2006).

3.   V disertaciji smo podrobneje proučili določeno vrsto vezi, neformalne vezi druženja, v kulturnem kontekstu (Finska), kjer druženje izven delovnega mesta ni vzpostavljeno kot kulturna norma.

4.   Disertacija ima namen prispevati k teoriji vodenja. Z osvetlitvijo aspekta socialnih omrežij vodij timov smo proučili vlogo socialnih vezi, ki jih imajo vodje znotraj in zunaj tima in vplivajo na uspešno delovanje timov in resurse, ki jih vodje nudijo svojim članom.

5.   Z metodološkega vidika, disertacija pomembno zapolnjuje vrzel pri obravnavanju manjkajočih podatkov. Nudi širok pregled različnih metod nadomeščanja manjkajočih podatkov pri analizi socialnih omrežij in napotke za čim boljšo pripravo vprašalnikov in matrik za omrežja povezav.

6.   Disertacija ponuja tudi aplikativen prispevek k izboljšanju organizacijskih praks. Ugotovitve naše raziskave kažejo, da različni vzorci socialnih omrežij timov, poleg organizacijskih značilnosti kot sta velikost in staž v timu, pri timskem delu igrajo pomembno vlogo.