Effects of multiple network ties
Knowledge transfer and sharing in a network:
The effects of multiple ties

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Abstract

The aim of this paper is to contribute to the discussion on the issue of when knowledge leaks between various groups and when knowledge sticks within one learning group. Theoretical insights propose that one needs strong ties for knowledge transfer and sharing. A preliminary case study, however, suggests that strong ties with people outside the learning group can hinder learning within a group. These observations suggest that strong ties outside a group are not the only condition which facilitates knowledge transfer and sharing. The same case study suggests that for knowledge sharing the various groups should differ in their adopted task and topic.
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1. Introduction

One of the various platforms in which learning in an organization takes place, is within groups or communities. Groups are conceived as an intermediate level between learning by individuals and learning on the level of the organization (Weick and Westley, 1996). The conditions for learning within a community are fairly well established (Argote, 1999; Wenger, 2000). For example, members of a community must experience psychological safety (Edmondson, 1999), community members must trust each other (Nooteboom, 2000 b). Community members should adhere to the same epistemic perspective and language (Dougherty, 1992; Boland and Tenkasi, 1995). Thus, in order to realize learning in a group, two conditions must be met: there must exist an epistemic similarity between the members, and the social relationships should facilitate knowledge sharing. Knowledge sharing is understood as bringing one's knowledge into a group. In knowledge sharing a group builds up a common knowledge repository that is the building block from which learning takes place. Knowledge sharing takes place within a group and, thus, has to be understood within the context and social relationships within this group.

The next necessary step in organizational learning theory is how to have this community bound knowledge transferred and distributed in the organization (Argote, 1999; Brown and Duguid, 2001) or – the other way round – how and what knowledge from outside the group is available for consequently being shared within a group. For organisation-wide learning to achieve its ambition knowledge should be transferred from one group to another. Knowledge that is developed within one group should be available to another group. Transfer of knowledge should not be equated with dissemination of knowledge. It emphasizes 'a distinct experience, not a gradual process of dissemination, and depends on the characteristics of everyone involved' (Szulanski 1996, p. 28). Knowledge transfer often takes place between individuals in a network. It subsumes all the processes between individuals that make one individual in a dyad more informed (than he was) by the acquisition of knowledge that another individual already has. It is an entirely different question whether this individual will subsequently share this knowledge within a group. In the literature the distinctions between knowledge sharing and transfer are not applied in a consistent way. However, since it may be the case – as will be argued in this paper - that knowledge transfer does not automatically imply knowledge sharing, the distinction should be kept in mind. It might be the case that knowledge as developed in one particular group might not be shared within another group although knowledge transfer has taken place.

Previous research has indicated that people who are members of several (competing) groups might have difficulties sharing knowledge with each other. Competitors in the market, for example, that cooperate for some innovative purpose find it difficult to share (competition-) sensitive information in a group (Soekijad and Andriessen, 2003). Project groups where the members are drawn from various departments in an organisation seem not to be able to cooperate given the various commitments to 'their' department (Newell et al., 2004). One part of the case discussed in this paper shows the same pattern. Members of a Consultancy firm do not unconditionally share their knowledge with colleagues, although they are members of the same organization. A Consultant's knowledge gathered in daily task forces is not shared in learning groups with colleagues. Thus, there seems to exist an inconsistency between knowledge sharing and knowledge transfer processes. This inconsistency is already identified as a challenge between collaboration and competition in networks (Angehrn et al. 2003).

The reason why knowledge transfer within an organization is an important issue lies in the strategic advantage of knowledge (Grant, 1996). First, knowledge that is transferred within the organisation increases knowledge diversity. Using diverse knowledge is considered a necessary condition for innovation (Nahapiet and Ghoshal, 1998; Nooteboom, 2000 b). Divers knowledge is here defined as knowledge from various functional areas (Schneider and Northcraft, 1999). Secondly, using knowledge from different units helps to avoid 'glitches' that are a drawback in project work (Hoppes and Postrel, 1999) and thus helps to increase project effectiveness. Generally, knowledge transfer stresses the fact that there is knowledge elsewhere in the organisation that might also be useful for local application. Thus, organisational learning needs as one ingredient heterogeneity or diversity, as it is sometimes called, in knowledge. Knowledge transfer is the process that makes heterogeneous knowledge available for local use. Different reasons apply to why knowledge sharing is important. The definition of organisational learning hints at developing commonly accepted knowledge (Weick, 1991). Organisational learning is widely circumscribed as adopting similar knowledge. Knowledge sharing is therefore a conditional process for developing homogeneity in organisational member knowledge. The overall result of organisational learning should be an improvement in 'the range of an organisation's potential behaviour' (Huber, 1991). The need for both - heterogeneity and homogeneity in knowledge – for organizational learning is also recognized in the famous distinction between exploitation and exploration. The need for both types of knowledge renders the question of how processes of knowledge transfer (between groups) and knowledge sharing (within a group) are related to each other.

The aim of this paper is to explore factors that are responsible for this inconsistency between knowledge transfer and sharing. More specifically, the knowledge processes are analysed in the context of social network theory. Inconsistency is attributed to membership in various groups. In the subsequent section I will develop the social relationships in a network as they are considered necessary for knowledge sharing and transfer. I will explain the emergence of inconsistencies by the social dynamics within a network. Then, the case study is presented. The first part is an illustration of inconsistency. On the basis of the second part of the case study insights will be developed that can avoid these difficulties. The conditions are specified under which inconsistency between sharing and transferring knowledge can be avoided. These are deduced from the case study.

2. Network Analyses, Knowledge transfer and Knowledge sharing

Whether knowledge sharing within a group is realized depends on three factors: the opportunity, the motivation and the ability of members in an organization (Argote et al., 2003).

2.1. Influences on knowledge transfer and knowledge sharing

The following overview of factors influencing knowledge transfer and sharing indicates that a social network is a necessary condition in which these factors play a role:

- Opportunity: It is generally agreed that opportunity for knowledge sharing is established through appropriate social relationships between members in an organization. Learning is intertwined with a social component. Social relationships must satisfy three aspects in creating an opportunity for organisational learning: First, there must exist a connection between people in order to safeguard knowledge transfer. People must have contact with others for gathering new knowledge. Second, the type of social relationships should be 'appropriate' for knowledge transfer. Three, knowledge must also be shared in order to realize organisational learning. The three aspects are recognized by theories of social capital (Nahapiet and Ghoshal, 1998). They distinguish between social bridging capital and social bonding capital. Both represent distinct types of social networks that are appropriate for knowledge transfer and sharing, respectively. The contributions of social network theory for organisational learning will be discussed more thoroughly.
- Motivation: There are three lines of reasoning on how an individual's motivation to share and transfer knowledge is influenced. Some conceive motivation as an individual characteristic that can be influenced by an organization's reward system. Other approaches stress the efforts an individual must undertake to share or transfer knowledge as an important variable. Effort is interpreted in two ways: it can take an individual cognitive effort to explain particular knowledge to someone else. Effort is, then, related to cognitive ability and absorptive capacity (Nooteboom, 2000 a). It can also take effort to maintain a social relationship. In this case, effort is connected with an individual's position in a social network (Hansen, 1999). It takes much more effort to build up and maintain a good relationship with somebody who works at a distance (for example in another project) or with whom one has irregular contact. Direct relationships are more prone to effective knowledge transfer (Uzzi, 1997). A third factor that influences motivation is reputation. Generally, one may assume that knowledge transfer and sharing is facilitated when one's reputation is improved. Being perceived as an expert enhances the readiness to share and transfer knowledge (Borgatti and Cross, 2003). Reputation as motivator has, as a precondition, a tight social network through which reputational effects are realized. In sum, the motivation for knowledge sharing is determined by multiple factors. Effort and reputation as motivators for knowledge sharing and transfer, both, presuppose a tight social network. Here, again, it becomes clear how knowledge sharing is related to social networks. Relationships in a network form the ground on which motivational factors can be realized.
- Ability is a third type of factor that influences organisational learning. As already mentioned, it could take too much effort to transfer knowledge to a colleague because of his (low) cognitive and absorptive capability (Nooteboom, 2000 a). This is often the case when people from diverse disciplinary backgrounds need to share their knowledge. Brown and Duguid (2001), therefore, state that successful knowledge transfer only takes place between people with the same background knowledge and the same experience in practice. Cognitive similarity is also correlated with social networks as people with tight connections develop 'relation-specific heuristics' that facilitate understanding (Hansen, 1999).

It can be concluded that various factors play a role when actually realizing knowledge transfer and sharing. Social relationships in a network are a necessary condition for knowledge transfer but do not sufficiently explain the reasons why knowledge is also shared. For successful knowledge sharing, there should be a 'fit' between opportunity, motivation and ability (Argote et

al., 2003). As indicated above, there is already a lot of insight into what establishes the 'fit' between opportunity, motivation and ability for knowledge sharing and transfer. In general, strong ties in a dense network are appropriate for knowledge sharing. However, there is relatively little insight how the overall structure of the network influences the 'appropriateness' of local relationships for knowledge sharing. Relationships in networks are considered as balanced and without tensions. It is assumed that the wider network does not have an influence on an individual's learning behaviour in a group i.e. on an individual's motivation or ability. Only the direct relationships are considered important. The sources for motivation and ability are sought in the direct relationships, leaving the wider network conditions in creating the opportunity out of considerations. This assumption is questioned here.

The aim of this paper is to investigate the influence of the wider network on local relationships. I will show how the wider network influences knowledge sharing in a local part of a network. Furthermore, it will be shown that although the conditions for knowledge transfer are appropriate in the wider network (through strong ties), this does not automatically lead to actual knowledge sharing behaviour within the group. The overall network structure can have a disturbing or advantageous influence on the local conditions. Thus, I suggest a type of contingency approach where the local relations are embedded in a wider network structure. In order to investigate this influence, I will first explore theories on social capital, networks and knowledge processes. Next, I will explain the source of the 'influencing effect' of the network structure. In the case study, I will demonstrate how this influence inhibits knowledge sharing. I will explore conditions under which this disturbance can be avoided.

2.2. Social Networks and learning

Theories on social capital and learning assume that social relationships in a network structure establish the necessary conditions for learning. More specifically, two types of social capital are distinguished that both have different functions in organisational learning:
- social bonding capital
- social bridging capital

Social bonding capital stresses strong ties between the members of a group. Strong ties are described as friendly, regular and intensive interactions. Next to the type of relationship, social bonding capital needs high density of ties within the group. When everyone talks to everybody, density is highest. Both characteristics – strong ties and high density – facilitate the development of common norms in a group (Coleman, 1988) through the mechanism of structural embeddedness (Granovetter, 1992). Appropriate norms of trust will improve motivation for knowledge sharing. High motivation can, to a certain degree at least, compensate for missing abilities. Participants will undertake more effort to explain their knowledge.

Social bridging capital is defined as connections between people that bridge a 'structural hole' (Burt, 1999). A 'structural hole' in a network exists when parts of a network are not connected to each other. In this case, information flow stops. A bridge in the network structure is somebody who connects otherwise unconnected parts in a network. Such a bridge is sometimes called a 'third party' or 'the third'. Social bridging capital is realized when a third party bridges the structural hole. This means, that information is transferred that otherwise would not be possible. In order to realize knowledge transfer from diverse sources one would need such bridges.

In theories on social capital and organisational learning a rather consistent insight exists: First, knowledge transfer takes place between people with strong ties. Secondly, knowledge sharing takes place in a group of people with a dense network structure next to strong ties. Strong ties facilitate both sharing and transferring of fine-grained and complex knowledge. Moreover, strong ties guarantee that exchange partners take the effort to explain their knowledge in detail. Additionally, relation-specific heuristics are developed within strong relationships that facilitate understanding and thus diminish the necessary efforts in the long run (Hansen, 1999). People with strong and dense ties towards each other develop commonly accepted norms of reciprocity that facilitates knowledge sharing. However, the other way round, arduous relationships between knowledge source and recipient are disturbing for knowledge transfer specifically under the condition that knowledge is not well understood (Szulanski, 1996).

The dark side of relationships for learning is that there is a tendency in such a network to close itself off from others, this is circumscribed as the 'paradox of embeddedness' (Uzzi, 1997). Thus, organisational learning presuppoeses strong relationships with people outside the group in order to get 'new' knowledge (knowledge transfer).

Reagans and Zuckerman (2001) argue that in order to combine both types of capital network ties should consist of strong ties. There should exist strong ties that bridge structural holes. There should also exist dense relationships.

The ideal situation for knowledge transfer and sharing is depicted in figure 1.

[insert figure 1 about here]

This figure demonstrates, first, how knowledge (from outside the focal group D) can be transferred in such a network structure: the members of the group have strong ties with other groups. Thus, for example, member 2 and 1 form a bridge between the otherwise non-existent ties between group B and C. Secondly, the figure demonstrates that all knowledge transfer and sharing is realized by strong ties. Thirdly, knowledge sharing can be realized in strong and dense ties within the group D. In sum, combining the structure of the 'global' network (A, B C) with the local network (D) illustrates how two types of social capital can be realized in this network (Reagans and Zuckerman 2001) as knowledge transfer and sharing is facilitated by strong ties. The necessity to bridge structural holes for organisational learning was already stressed above. A bridge supplies a group with new 'outside' knowledge. Burt (1992) argues that a person who bridges a structural hole in a network is in the most advantageous position for knowledge transfer. He is in the centre of two independent networks and can play the role of 'tertius gaudens': he can use his knowledge of one group in favour of his position in another group. In figure 1 Person 2, for example, is such a bridge between network B and C via person 1.

However, as was already mentioned, there are numerous examples that indicate that strong ties between groups might be a necessary prerequisite for knowledge transfer but are not a sufficient condition for knowledge sharing. Even if the opportunity to transfer knowledge between strong ties is created this does not ensure that the transferred knowledge is shared subsequently. Even more, the strong 'outside' ties for transfer can be a barrier for 'inside' sharing. The difficulty of cooperation and learning between competitors is an illustrative example (Soekijad and Andriessen, 2003).

The position of the third party needs to be investigated in depth. Krackhardt (1999) confirms Burt's findings about the opportunistic behaviour of the third person. He argues that the

advantageous position of the bridge exists only under the condition that the two networks are totally independent. When two groups are connected to each other exclusively via one third party, then Burt's argument prevails. However, when there are additional connections between two groups, then the third person is maximally constrained. In this case, according to Krackhardt (1999), the third person's behaviour is public and, therefore, he must follow the norm sets of the two groups. In figure 1, this is the case for person 3. As his behaviour is public via a connection between person 4, and 6, person 3 is maximally constrained in his behaviour. He must follow the norms of group D and the norms of group A. In this case, person 3 has in principle the opportunity of transferring knowledge. However, Krackhardt's argument predicts that person 3 will not share this knowledge in group D – as long as the norms in group D and A are different or contradictory. This is probably the case in competitive alliances.

This line of reasoning suggests that strong ties eventually create the opportunity for knowledge transfer. However, in the case of public behaviour, strong ties diminish the motivation to share knowledge in case the behavioural norms are different in the two groups. In the case of public behaviour, strong ties in one group can conflict with strong ties in another group. Although there is an opportunity for knowledge transfer in the network structure, knowledge sharing could be hampered. In this case, the same network structure that creates an opportunity for knowledge transfer also constitutes a constraint for knowledge sharing. In this situation, the overall network structure influences behaviour in the local group.

3. Case study

A case study was conducted in a consultancy firm (Bogenrieder and Nooteboom, 2004), called here Dutch Consultancy (DC). DC is a global management consultation and information technology company present in over 20 countries with 31,000 employees.
The research was conducted at the Dutch branch of DC. The business unit called Business Consultancy (DCBC) consisting of about 80 people was especially investigated. During 2000 14 semi-structured interviews were conducted with senior (6) and junior business consultants (5), managing consultants (2 persons) and with the manager of the entire business unit (1). Junior and senior consultants are divided in 'functional groups' with a managing consultant as head. The interviews were conducted with two functional groups, one will be called 'project improvement group', the other is called 'development group'. Such functional groups consist of about 15 members. When an assignment is acquired a project group is put together. This project group normally consists of consultants from various functional groups. Depending on the assignment the groups are put together in a variable way. So there are always weak links between the 80 consultants. Consultants from various functional groups are drawn together for the purpose of the assignment depending on their expertise, experience (in earlier projects) and availability.
Daily work in the project group is described as intense. The client's assignment has to be fulfilled. The consultants feel committed to their current projects. They are used to having strong and dense ties with their colleagues in a current project group. There exist weak ties between the project groups (in figure 1 A ,B,C are examples of project groups). Because of the temporary character of a project group weak ties between persons could develop into strong ones when they are assigned to a common project.
DC has a clear vision on HRM policy. There is strong emphasis on consultant professional development and drive for excellence. The consultants are considered as the organization's asset.

There is also a strong emphasis on individual responsibility for one's professional career and professional development. The general view is that the organization can facilitate professional development but it is the individual consultant who has to pursue it.

Financial reward consists of two components: one is a basic component; the other component is a certain percentage that depends on i) the performance of the national branch, and ii) the performance of the whole business unit. Reputational rewards are considered important within BCDC. Succeeding in highly risky and complex projects improves one's reputation. In future, such a person will get (again) prestigious projects and better career perspectives.

Since its establishment some five years ago, major reorganizations have taken place. One year before this research was conducted, the management of BCDC had decided that every consultant must become a member of a functional group. The reasons were, first, the managing consultant should take care of a steady workload for every consultant. A second function of the functional group was to insure communication from (top) management to the individual consultant. This was especially important as many of the consultants stay at the client's site and are, therefore, rather disconnected from the informal communication in their home office. The third reason was that learning should be facilitated in the functional groups. This became the more important the more client's demands and claims increased. Management of BCDC did not supply any guidelines on how the learning function in the functional groups should be realized. One year after the decision to establish functional (learning) groups, the manager of BCDC thought that two types of functional groups could be distinguished: the 'project improvement group' (most of the functional groups adopted this format) and a 'development group'. I investigated only one example of the project improvement group. In the following, I analyse the project improvement group.

3.1. Case Study – Part 1: the project improvement group (PIG)

All 15 participants of this group were involved in project groups. Two members were involved at that time in the same project group. If this is compared to figure 1: person 3 and 4 were involved in group D; in their daily work they were also involved in group A. Other group members of the PIG were involved in different projects. We note, that the network structure between strong and weak ties is constantly changing depending on the composition of the project groups.

When management of BCDC had decided that the functional groups should also realize a learning function for their members, the participants in this PIG had decided to take their current projects as input for learning. The idea was that a member should present (parts of) his current project. Especially questions or problems in the current project should be addressed. The group then should help to improve this project by advising and by giving hints and tricks. The plan was to learn something from colleagues in the PIG that should be directly applicable in the project – almost literally tomorrow. As one participant said:

> *"The added value for learning for our own project depends on what one gets back. 'Getting back' something is getting feed-back, supporting tips and hints, etc. I have advantage of the feed-back when I really can apply the feed-back in the situation with a client, when I do other things, when the process goes better, when the process goes better, yes."*

However, this intention of acquiring directly usable knowledge did not work out in the PIG. The group did not develop a strong and dense network. The meetings of the group took place once a month. After the first enthusiastic reactions members began to attend the meeting irregularly. If a

reason for absenteeism was given at all, urgent work in the project groups was mentioned. Reasons were not questioned by other group members. A social norm for attending the meetings was not developed. Colleagues did not urge one another to attend the meeting and to give a presentation of their project. Thus, the strength and density of the network was low.

A typical meeting started with the announcement by the managing consultant. Then every attending member spoke about his current project. The superficial way in which this happened is described in the following:

> *"It is no problem to give a presentation about the project you are in. However, to expose oneself to criticism – how you do things in a project – that really does not happen."*
>
> *"It is more like sending messages but there is no depth. For example, you could do a role play. The deeper question would be, why does a consultant let this happen? The barriers should be looked for in the consultant. That would be depth. Now, we are talking about tips and tricks. But when the discussion goes deeper the person has to get committed, it becomes more difficult to be open. Then you talk about people."*
>
> *"If there is no commitment, that is my experience, you keep operating as an individual. You do not get wiser from the group, you do not contribute to the things in the group and that makes a difference in the results. Here, I specially think of the results within the group."*
>
> *"The common interests are far away in this group. The commitment for this group is less. If you do not come, you will become an outcast."*

All these quotations make clear that the members did not succeed in becoming involved in intensive interactions. They narrated about their projects but did not want to get involved in a deep discussion, certainly not about their own way of functioning. Commitment was missing, as they said. All these observations show that the PIG did not succeed to build up strong ties.

The situation in PIG is depicted in figure 2.

[insert figure 2 about here]

As a consequence knowledge sharing did not take place. This is exactly what theory predicts: if there is no strong and dense network, knowledge sharing does not take place. The consultants did not share valuable knowledge. The information provided was on a rather superficial level.

> *"People who do not know each other, are a bit more careful towards each other. They do not dare to be vulnerable."*
>
> *"However, it becomes the more interesting the more you know from a project, then a dialogue can start, but that is not possible in such a group."*
>
> *"I would not discuss such a project [a highly complex and risky one, I.B.] in this group. I would just mention it as a type of example on a high level of aggregation."*

Theory predicts that strong ties facilitate motivation to share knowledge. This can be confirmed in its reverse: Interesting knowledge was not shared. Furthermore, members did not make much effort to make their knowledge understandable for others. Instead, they would have preferred another topic.

> *"There are a lot of colleagues who are not involved in the same project. At the moment that it goes so deep into the situation in a projects that only two or three people can understand what it is all about, then it should not be discussed in this group. Then it is too situation specific. I would like to discuss themes that are well-known to all of us. If somebody else has a problem, I should recognize the same problem."*

> *"There should be themes which the whole group is interested in. On the one hand, this should be a generic theme for all but it should also be important for the projects. To speak about resistance to change generally, that is nothing. Thus, it should be about resistance to change and how you deal with it."*

Up to now, this analysis confirms the results from research, albeit in the negative sense: when strong ties are missing, knowledge sharing does not take place. As all the members had strong ties in their project group knowledge could be easily transferred.

In order to gain insights into the function of the global network in this process, it is interesting to look into the reasons why knowledge was not shared. First, missing strong and trustful ties are mentioned – as theory predicts.

> *"A talk within four walls has safety-checks. In a group this is less the case. There is a lot of ambition within a group and one wants to realize these ambitions. One does not want to be open about things that could be barriers for the ambitions. The information within a group must be safe. Some things should not be discussed; there should be a type of protocol on what is legitimized and what not."*

Possible damages in the reputation are also mentioned. These damages could take place if there were strong ties in the PIG. In this case, knowledge shared in the PIG could go into other parts of the network via bridges and as a consequence could damage a person's reputation.

> *"The information that comes out in the group has to be safe. Some things could play a role in one's career. That's why individuals do not want to admit they are incapable of certain things."*

For instance, if person 3 in figure 2 had strong ties with person 5 and shared knowledge, this knowledge could also get to group C. This could imply that person 3 will not be asked on prestigious projects in the future by people from group C. Thus, damages in the reputation could happen because what is said in the PIG gets outside via bridges. Again, theory can be affirmed in the reversed sense. As reputation is a motivator for sharing knowledge possible damages to reputation decreases motivation. Two issues should be mentioned here. Damage to reputation had not yet happened. It was the expected or suspected damage that might happen that hindered knowledge sharing. This damage could take place because of the existence of strong ties outside group D. However, as mentioned, in reality strong ties were not built up in group D. This is one situation where an influence from the global network on the local network might play a role.

> *"There are a lot of ambitions in the project group and the participants want to achieve them. They don't want to bring up matters that will hinder them from reaching their goals."*

> *"It is more narrating, it is not a reasonable replication of the project, from which you could get new ideas. However, it becomes the more interesting the more you know from a project, then a dialogue can start; but that is not possible in such a group."*

As these quotations indicate, the norms in the project group and in the PIG are different and even contradictory. Whereas the PIG would profit from discussions about members' current projects, bringing out these details for discussion in the PIG does not take place. As mentioned, in BCDC one is highly rewarded in bringing a project to a successful end. The norm in the projects is, in fact, not to fail. The norm in PIG was intended to be entirely different: the problems and drawbacks in a project should be discussed (and improved). Thus, there are two different norm sets in the two groups. If Krackhardt's analysis is applied to this situation it can be concluded that the third person(s) is maximally constrained in this situation. For example, the norm in group D is

speaking about the drawbacks of a project; the norm in group A is terminating the project successfully; person 3 had to obey different norm sets. Non-compliance to one of the two norm sets would come out because of alternative ties. In order to avoid this situation strong ties in D did not develop. In this way Krackhardt's results can be confirmed. As long as there are different norm sets in two groups and there is public behaviour, the third person is maximally constrained. Members of groups in such a situation will not share knowledge although the network conditions allow for knowledge transfer.

This is another point where the influence of the global network on local knowledge sharing is identified. However, it is difficult to indicate a cause-effect relationship. Did not the members build up strong ties in order to avoid knowledge sharing or was it the other way round?

This case is the first indication of how ties in the overall network structure influence sharing behaviour within a local group. However, this case is in fact a negative one: it shows how ties in the global network hinder the establishment of strong ties in a local part. It is not yet known whether strong ties would develop under different conditions in the same network structure.

3.2. Case Study – Part 2: the development group (DG)

The interesting situation in this case study was that one functional group in BCDC had decided to follow a different trajectory. The network structure was comparable to the one in PIG. In this group three members were involved in the same project, the others in a different one.

After a period of doubt members of the DG decided not to learn on the topic of project improvement but to take the individual professional development as learning theme. The group decided that the individual professional skills should be improved within this group – hence professional development. These skills are conceived as independent from the current project. They have a more generic and long-term character.

> *"Ultimately, a group has developed where their own experience and project-bound questions are discussed as a type of case."*

The group developed a strong and dense network. Interaction was intense. Members attended the meetings regularly. When somebody did not show up, the others enquired why and urged this member to come. Urgent work in the project was not accepted as a reason for absenteeism.

A typical meeting started with the usual management announcement. Then, a short introduction in a specific topic of consultancy skills was presented by one of the members, for example: how to deal with resistance to change or how to give unasked (and unpleasant) advice to a client. The remaining biggest part of the time was for discussion between the group members. Members reported that they learned a lot because their colleagues asked very critical questions that hit them in their personal-professional development. They felt a high commitment towards one another.

> *"In this group learning is not about knowledge, but about interpersonal skills to know yourself better and to learn how others experience you. The group is an experimentation room; you have different types of clients and in this group different types of members."*
> *"And then you notice good exchanges of experiences, and not only from the seniors to the juniors, the seniors admit that they also have advantages from the juniors; in this way we find it very valuable."*

Members undertook a lot of effort to understand and help each other. Participation was high and equally distributed among the members. The discussions about professional development were conducted in a hypothetical way and in 'near histories' (March et al. 1996). Members spoke about their experience in various projects in the sense of 'what once happened to me…' or 'what I once

encountered…'. In this way the connection with the real projects was hidden. It did not matter where the knowledge came from. Current experiences in a project were also hidden in their relevance.

> "This group is not used as a coaching trajectory for the daily projects; one could exchange experience; one member would be in the focus."
>
> "Earlier, time to send was shared, now it is much more interaction. The earlier mismatch with the daily projects has disappeared. One does hardly deal with the [daily] projects in this group. The commonality lies more in the development of their own skills; sometimes projects are brought in but the important part are their own skills."
>
> "I would not discuss a badly performing project of mine in this group. I would only discuss some aspects from such a project."

In fact, the DG did not make use of the strong ties with current project groups. Knowledge about the current projects was not transferred – at least not directly. The strong ties with the current project were not used for direct knowledge transfer. This does not imply that the strong ties were superfluous. Members in the DG used their knowledge in the projects and translated it into a near or hypothetical story. Knowledge transfer through strong ties created the bases for knowledge sharing in the DG, however, the 'true' story or the 'true' knowledge was not shared within the DG. Therefore members were not afraid of reputational effects in the network. Finally, they did not talk about the real project. Although, the DG did not use 'real' project knowledge, members nevertheless felt that they use their newly acquired knowledge in their daily projects.

> "And then you could notice, the insights from the group are always used in your concrete work. Within the group, really difficult questions are posed to each other. Through this thought processes are initiated."
>
> "I strongly believe that I can now put questions to the client which I could not put two years ago."

This part of the case study reveals different results concerning processes of knowledge transfer and sharing. Although the global network structure is comparable to the one in the first part of the case study, members of the DG were now able to develop a strong and dense network without being afraid of disadvantageous effects in the global network. The main difference with the first part was the type of knowledge that is transferred and the type that is really shared in the group. The 'original' knowledge from the projects was not directly brought into the DG. Although the conditions for transferring knowledge in strong ties with the outside network existed, members made an extra effort to translate knowledge into a form that was usable in the DG and which also fit with the purposes of the DG. Through this translation, members of the DG avoided becoming involved in two contradictory norm sets about the same topic. The dense ties in group D were used for a different purpose than the dense ties in group A. The theme of 'current project' was not discussed in two groups. In this way, members avoided having to obey different norm sets on the same topic. Instead, transferred knowledge was manipulated and adapted to the topic in the DG. In this way, the influence of the global network on behaviour in the local network was constrained. Nevertheless, the DG made use of the strong ties in the global network for knowledge transfer.

4. Analyses: Research Questions and Conclusions

This case study has many constraints. Next to methodological questions, generalization is unclear at the moment. It is not known to what extent the development of the two types of groups depends on the specific characteristics of a consultancy firm, where the individual consultant with his skills is often the most important asset. Furthermore, it is not clear whether the results depend on the company specific reward system and culture. It could also be the case that the two types of groups are just developed by chance and that they do not demonstrate the influence of a global network on the local one. However, the interview results suggest that there is an influence. Whether this case study covers all the relevant variables how a global network has influence on a local part is not clear at all. Therefore, the case study will be used as the first exploratory study in order to develop more refined research questions. As this case study is a comparison between two different types of (not) learning groups in the same context of a global network, it offers the possibility to identify variables that might explain how processes of knowledge transfer and knowledge sharing relate to each other.

This research confirms previous findings that knowledge transfer is facilitated through strong ties in a network. Additionally, knowledge sharing is easier when strong and dense network ties exist. In such a group norms of reciprocity and commitment develop that increase motivation to share knowledge. However, this preliminary case study (especially in its comparison) suggests that the question whether such a highly committed group in a global network develops, at all, depends on various factors in the global network structure. More precisely, it depends on how the outside ties fit with the inside ones. The case study suggests that this fit depends on three factors:
- degree of usability of transferred knowledge
- degree of sameness or differences in topics (purpose)
- degree of sameness or differences in tasks

The case study reveals that clusters of strong ties concentrate around different tasks, either around project accomplishment or learning tasks in the functional groups (PIG and DG). There is a division of labour in knowledge work. Functional groups were intended to develop and reflect on knowledge that should subsequently be applied in the project groups. Very roughly, project groups had a more exploitative task whereas the functional groups had a more explorative task, albeit that on the latter one some differentiation had taken place. Knowledge transfer is necessary because of this division in labour. Specialization makes knowledge transfer in both directions necessary. This is different to transfer of knowledge for best practices where knowledge travels in only one direction from those who have a best practice to the don't haves. The case does not cover the situation of knowledge transfer for best practices. Knowledge transfer under the condition of specialized tasks needs a two-way traffic that automatically brings in differences in time and time delays. Here lies the reason why participants in PIG already took into account prospects in their future reputation in the network. Axelrood (1984) has described the influence of the future on current behavior as 'shadow of the future'. As knowledge transfer and sharing needs strong ties, an individual's reputation will be known within the network. Thus, future reputation will determine actual behaviour. The first proposition thus is:
Specialization in tasks presupposes knowledge transfer into two (or more) directions with differences in time between strong ties. Consequently, future position in the network determines actual behavior.

Both PIG and DG had specialized tasks. However, the tasks of PIG still had the same topic as work in the project groups. It should help to accomplish daily projects in a more successful way. PIG and project groups had different tasks yet the same purpose or topic. At first hand, this would imply that there was no need to make a translation effort in knowledge transfer. It could be assumed that there is a linear relation between specialized task with the same topic and decreasing effort in knowledge transfer that will enlarge knowledge sharing. However, the empirical results show a very different picture; the case study reveals that transferring knowledge on the same topic still requires extra effort as one has to explain fine-grained and complex knowledge to someone with whom one does not have strong ties. This was the case in the PIG where consultants complained about this effort. These results are already recognized by Hansen (1999). This would suggest a proposition like: 'Efforts to transfer knowledge are related to specialization in tasks. The greater the difference between the tasks the greater the necessary motivational effort.' However, this proposition does not apply for the DG. There, the differences in tasks were even bigger than in the PIG and yet they did not complain about the effort. In the DG exploration took place on an entirely different field or topic than in the project groups. Thus, the degree of differences in tasks cannot be the only explanation. The proposition now should be:
Efforts to transfer knowledge are related to specialization in tasks. The greater the difference between the tasks the greater the necessary motivational effort. This motivational effort is diminished when different topics and different tasks exists.
However, it also becomes clear that an effort always has to be made to transfer knowledge into something that is usable in the receiving group. Knowledge has to be embedded and adapted to the various tasks:
There is always a need to translate knowledge in transfer processes because of the embeddedness of knowledge in (specialized) tasks.

Furthermore, the investigation also indicated that having the same topic and, yet, specialized tasks works even counterproductively for knowledge sharing at least in a network with strong ties. The reason as supplied by Krackhardt (1999) is the existence of two differing norm sets in two groups. He defines norms 'as sets of rules how one behaves as the price for staying a member of the group'. Norms describe modes of behavior that are 'permissible in a group'. What is not permitted in a group is thus forbidden. If these norms sets are contradictory towards each other knowledge sharing will not take place. This was exactly the case in the PIG. As they had specialized tasks within the same topic contradictions in norms easily occured. Participants are inclined in the same topic but have to fulfill different tasks. In the case of strong network ties participants are then maximally constrained in their knowledge sharing behavior. This observation is strengthened by the comparison with DG: they also have specialized tasks yet a different topic. These observations suggest the following proposition.
When there are specialized tasks and the same topic in strong network ties knowledge sharing is severely constrained because of contradictory norms that are induced by dealing on the same topic. Strong ties are nevertheless necessary for knowledge transfer and sharing.

At this point the influence of the global network on a local group is most evident. The influence has its source in the discrepancy between the same topic and yet different tasks. This suggests that a network with strong ties should be torn apart in different tasks and different topics. Overlap between topics should be avoided. However, what is then the value of knowledge transfer when groups are different in the topic and in the task?

The DG has chosen an alternative pathway. Their situation can be described as 'different topic and different tasks'. The danger in this situation is that topic and task in the various parts of the network get separated from each other. In this case knowledge transfer would not make sense anymore. Weak ties between parts of the network would be sufficient in such a network. In the case study the participants, however, stressed the point that what they learn in the specialized task of the DG is also usable in their work in the project groups although there are differences in topic and task. If Krackhardt's insights are further developed, this would imply that the DG and the project groups had different norms yet the norms were not contradictory. Behavior permissible in the DG is not the same behavior as prohibited in the project group. Instead, norms were complementary. As a consequence knowledge sharing was not constrained.

Two conclusions can be drawn from this: in the situation where there are differences in tasks and topics, knowledge sharing is facilitated by complementary norms. Complementary norms have their origin in the differences between tasks. Although the tasks are different there should be a connectedness between the topics, however. In this case, the connectedness consisted on professional development in the DG that has a positive effect on the success of the projects. Under the condition that topics and tasks are different there should exist a positive connectedness between participation in various parts of the network. The proposition is therefore:

Although differences in tasks and topics should exist in parts of a network there should also be a positive connectedness between the topics. It is unclear whether positive connectedness is also necessary on the level of tasks.

These propositions are developed from a preliminary case study. They should be examined further. The identified propositions offer a consistent framework of how to understand processes of knowledge sharing and transfer within a global network.

It became clear from this analysis that the global network ties have influence on the development of local network ties. This, again, has influence on knowledge sharing within a (local) group. For facilitating knowledge sharing in a group norm sets between groups should not be contradictory. In order to avoid such a contradiction I suggest that groups should differ in their task and their topic in order to make knowledge sharing possible. Such a difference in tasks and topics, then, puts the question how different the group's topics should be. I suggest, although, there is a difference between the groups' tasks and norm sets, their topics should, nevertheless, be related to each other. It is still unclear how relatedness in topics can be conceptualised.

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Figure 1: The ideal network situation for knowledge sharing and transfer (adopted from Reagans and Zuckerman, 2001)
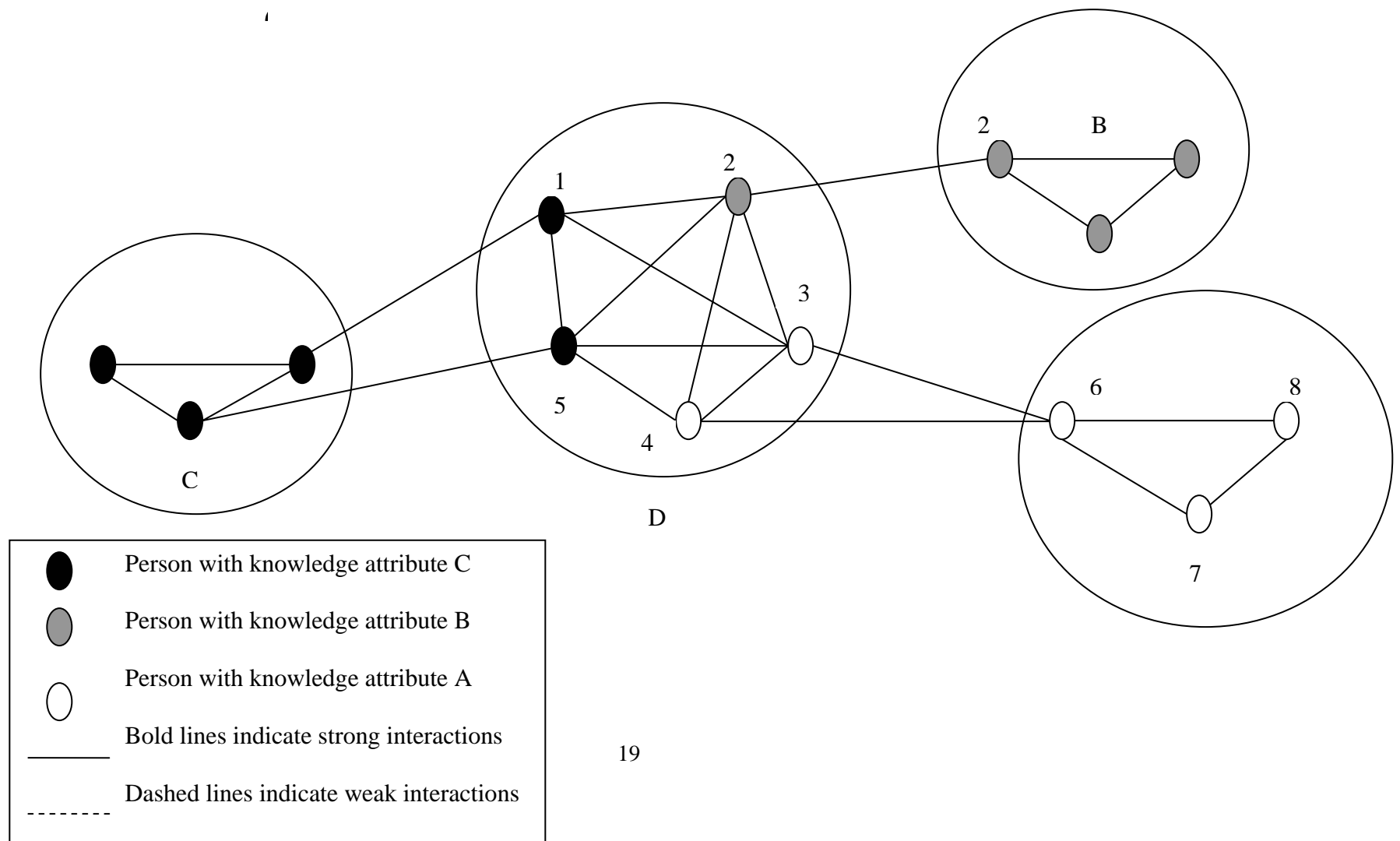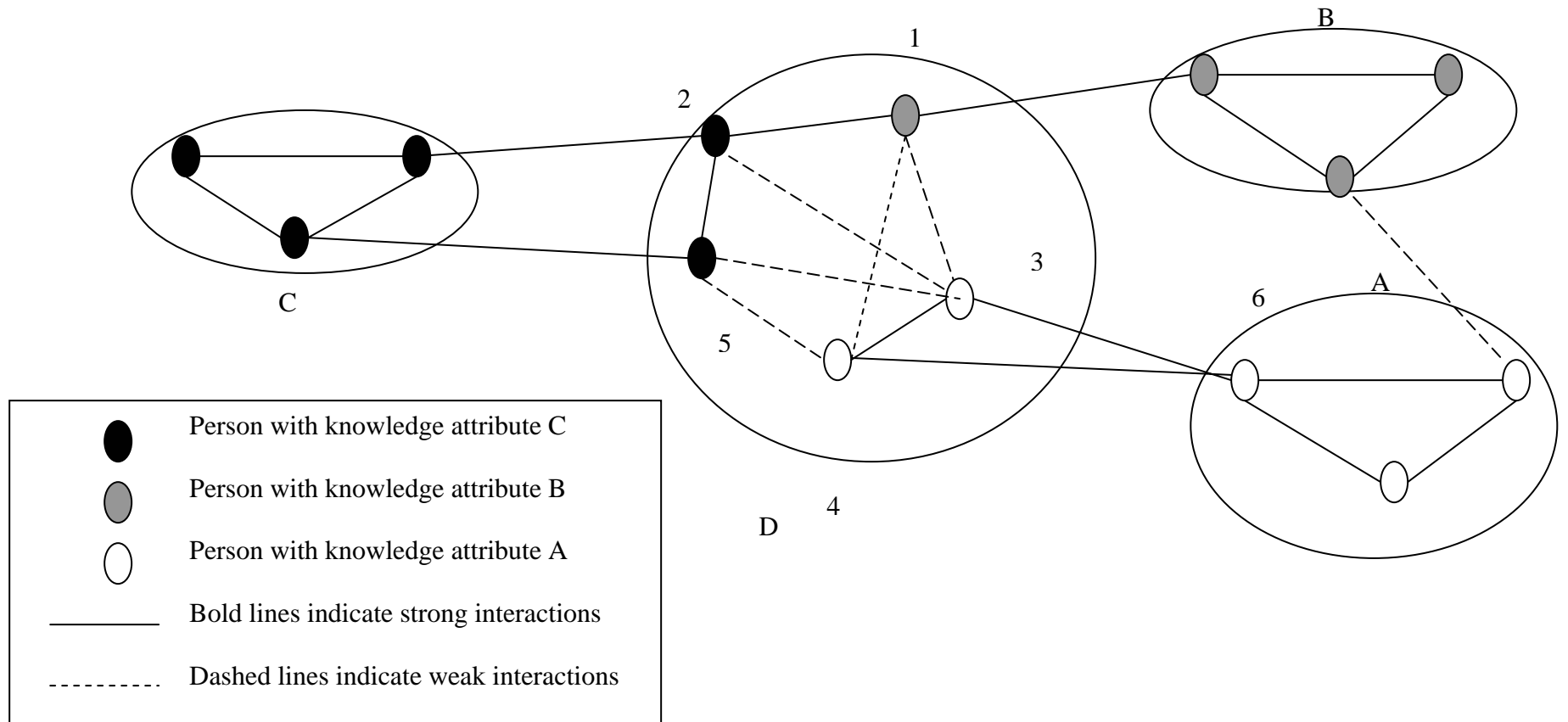
19

Figure 2: The network structure for the 'PIG'

1

2

B

3

5

4

6

A

C

D

Person with knowledge attribute C

Person with knowledge attribute B

Person with knowledge attribute A

Bold lines indicate strong interactions

Dashed lines indicate weak interactions

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