Unpacking the collegial network structure of beginning teachers' primary school teams

A mixed-method social network study

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Abstract

Mixed-method approaches to social network analysis have been presented as a promising way to establish a more global understanding of networks. Particularly, research has acknowledged the power of qualitative data to help interpret and nuance structural properties of networks acquired through quantitative data. This chapter aims to provide a thorough understanding of the network structure in the context of teachers' first years in the profession, using a mixed-method design. The chapter first provides a short theoretical background. Next, the mixed-method design is described, and the results are delineated. The results reveal that for most beginning teachers (BTs), the assumption that access to resources in the network is positively associated with their job attitudes seems to be supported. The qualitative data provides explanations for the cases where the assumption seems to be incorrect. The chapter concludes by discussing the added value of the design, limitations, and guidelines for practice.

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Introduction

Recently, enhanced awareness of the importance of people's interconnectedness has resulted in an increase in the use of social network analysis (SNA) across a range of research domains, including education (Moolenaar, 2010). SNA has its origins in both quantitative (e.g. sociometry) and qualitative research fields (e.g. ethnography) (Crossley, 2010), but has primarily received attention from a quantitative approach (Edwards, 2010). Quantitative SNA can systematically identify the structural patterns of networks (Edwards, 2010) and enables an investigation of the extent to which an individual has access to the resources (i.e. support, knowledge) flowing through the network (Burt, 2000), see also Chapter 12 Laengler. By focusing on the patterns of relationships, a valuable "outsider" view of the network can be obtained (Edwards, 2010). Conversely, qualitative SNA represents an "insider" view of the network by focusing on its content and people's perceptions of the network. Through network stories, network members' subjective views of the meaning of ties and the complex processes of sense-making that constitute the network can be obtained (Crossley et al., 2015; Kelchtermans, 2009), see also Chapter 15 Murphy.

Although quantitative and qualitative approaches are valuable in their own respect, both have their limitations. Quantitative social network approaches reduce the complex reality of networks into numerical data (Crossley et al., 2015), while qualitative social network approaches lack the ability to identify the complete picture of the network structure (Crossley, 2010). In this respect, their complementary benefits and disadvantages plea for a mixed-method design in which both methods are used in conjunction to obtain a more global understanding of the network (Crossley, 2010). Combining qualitative and quantitative strands enables numerical data to sketch a complete picture of the network's structural properties, and allows qualitative details that reflect the complexity of reality to build upon this more "objective" numerical data (Crossley, 2010).

This chapter reports a mixed-method social network study involving beginning primary school teachers. A pressing concern in many countries is the high number of teachers leaving the profession in the first years of their career (Cooper & Alvarado, 2006). The substantial drop-out rates, and their negative consequences, such as teacher shortages (Geiger & Pivovarova, 2018), have led to a search for factors important in the choice to stay in the profession. In this respect, BTs' job attitudes have been found to be important precursors of teacher retention (e.g. Meyer, Stanley, Herscovitch, & Topolnytsky, 2002). In turn, research reveals that professional collegial support relationships are important in influencing these job attitudes (e.g. Struyve et al., 2016). The few studies that use the social network perspective to explore collegial networks of BTs have often focused exclusively on quantitative methods (e.g. Struyve et al., 2016). In this chapter, we use a mixed-method SNA approach to explore the structure of BTs' primary school team and how this is related to BTs' job attitudes.

Theoretical background

Teacher retention crisis

Teachers' first years in the profession are characterized as a career phase in which an intense professional development takes place (Kelchtermans & Ballet, 2002). Globally, numerous teachers leave the profession during these first years (Cooper & Alvarado, 2006). In the US and the UK, 30% to 50% of teachers leave the profession within the first years after graduating (Cooper & Alvarado, 2006). In Flanders (Belgium), where this study took place, approximately one in seven primary school teachers and one in five secondary teachers leave the profession in the first five years (Flemish Department of Education and Training, 2013). These high dropout rates are an important contributor to the shortage of teachers (Geiger & Pivovarova, 2018), and can have a negative impact on, for example, student achievement (Ronfeldt, Loeb, & Wyckoff, 2013).

Job attitudes, defined as the precipitation of how teachers feel and think about their profession and organization (George & Jones, 1999), are often used as proxies for teachers' decisions to remain in the profession. Job satisfaction, affective organizational commitment, and intrinsic motivation to teach particularly are considered important precursors of teacher retention (see Meyer et al., 2002; Struyve et al., 2016). First, job satisfaction is defined as teachers' evaluations of the extent to which their expectations match the actuality of teaching (Carmeli & Weisberg, 2006). Previous research found that the higher job satisfaction, the less likely people will consider other job opportunities, and the more likely they are to stay in the job (Carmeli & Weisberg, 2006). Second, affective organizational commitment refers to being involved in and having positive feelings of identification towards the workplace (Meyer & Allen, 1991). Scholars such as Meyer et al. (2002) have found that the more people have positive feelings towards their organization, the less likely they will develop intentions to leave. Third, intrinsic motivation to teach refers to teachers teaching because it is satisfying and enjoyable (Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012). Vansteenkiste et al. (2007) stipulate that the three basic psychological needs that must be achieved to feel intrinsically motivated (i.e. competence, autonomy and relatedness), encourage behavior, such as being less likely to leave. Interestingly, professional collegial support relationships have been found to influence these job attitudes (Struyve et al., 2016).

SNA: Outsider and insider perspective

Although there is an abundance of studies reporting that professional collegial support relationships are paramount for BTs, the use of the social network perspective to study these is still rare. However, the social network perspective is suitable to manage the complexity and interdependency inherent in studying teachers' relationships (de Lima, 2010), see also Chapter 2 Rienties. It explains that in the relationships among people, resources such as professional support (also known as "social capital") are transferred and that schools' social

structures and people's network position determine their access to these resources (Borgatti & Foster, 2003).

Most social network studies in educational research, have employed a quantitative approach to SNA in which the network structure is examined from an *outsider* perspective. Here, researchers take a general view on the patterns of relationships by mapping and measuring ties between people (Crossley et al., 2015). Using the outsider perspective, researchers can measure relationship patterns through structural properties (Edwards, 2010). Two structural properties associated with a person's access to the network's resources are germane to the current study: cohesion and centrality (Wasserman & Faust, 1994). Cohesion concerns the team's interconnectedness and pertains to the notion that the more people are connected to each other, the more they can gain access to the network's resources (Burt, 2000). Centrality covers network position and refers to the assumption that the higher a person's centrality, the more (s)he has access to the network's resources (Borgatti, Everett, & Johnson, 2013). Several scholars found that employees who are more socially tied into the organization's network have more positive job attitudes, and are less likely to leave (e.g. Ibarra & Andrews, 1993; Struyve et al., 2016).

Limited research has supplemented this numerical data on the network structure by taking an *insider* perspective. However, this way, researchers can unpack network structure, by considering the interpretation and subjective meaning of people's relationships (Crossley et al., 2015). Specifically, teachers make meaning of the information in their environment and act upon these interpretations (Porac, Thomas, & Baden-Fuller, 1989). By taking an insider perspective, and, as such, explicating these sense-making processes, the network structure can be more readily understood (Crossley et al., 2015; Kelchtermans, 2009). Put differently, an insider perspective investigates people's perceptions of the network using qualitative methods, allowing researchers to focus on the processes through which the network structure

emerges (Edwards, 2010). Crossley (2010) stresses that without these underlying processes, network structure becomes difficult to interpret. Previously, for example researchers have identified a negative work climate and lack of relational knowledge (i.e. knowing what someone else knows) as underlying processes for having a peripheral network position and a lack of cohesiveness in the network (see Cross, Parker & Borgatti, 2002; Daly & Finnigan, 2010).

Furthermore, Crossley (2010) emphasizes that qualitative data are necessary to investigate the effects arising from network structure, as the patterns of relationships do not have automatic and fixed effects, but are influenced by particulars revealed through network stories. Crossley (2010) illustrates this by referring to a study he performed in a health club. He created a map representing the club members' friendship ties and found a brokerage/closure configuration, which means there were two or more closed networks of which the members have no, or minor, contact outside of them, with one or more brokers forming a bridge between these unconnected networks (Burt, 2005). According to Burt (2005), this configuration has positive outcomes for both the broker (e.g., controlling the flow of resources) and the members of the closed networks (e.g., access to resources of other network(s) through the broker). Surprisingly, Crossley (2010) found that instead of advantages, the configuration led to tensions. Qualitative data revealed that, over time, the members of the closed networks had developed a group identity. Brokerage hampered this group formation process, causing the aforementioned tensions. Crossley (2010) emphasizes that this example shows that a combination of both qualitative and quantitative data can reveal interesting findings that are impossible to obtain using a single approach. This example from Crossley (2010), which is situated in a sociological context and focuses on brokerage, is intriguing, and begs the question if such-like mechanisms and processes could also be applied

in other contexts (e.g. BTs' first years in the profession), and pertaining to other structural properties (e.g. cohesion and centrality).

Research objective

The mixed-method social network literature shows interesting ways of exploring network structures. The use of these strategies has, to our knowledge, not yet been thoroughly applied in the context of teachers' first years in the profession. Therefore, the central research objective is:

> *To explore the collegial network structure of BTs' primary school teams, reflecting BTs' access to resources (i.e. professional support), and how this is related to BTs' job attitudes as important precursors of teacher retention.*

The common assumption guiding this study is that BTs' access to the network's resources (i.e. professional support), is positively related to their job attitudes (based on e.g. Ibarra & Andrews, 1993; Scott, Wasserman & Carrington, 2005; Struyve et al., 2016).

To fulfil the research objective (RO), two subgoals are delineated.

> *To explore the collegial network structure of BTs' primary school teams and its relatedness to BTs' job attitudes from an outsider/quantitative perspective (RO1).*

> *To understand the structure of the collegial network of BTs' primary school teams and its relatedness to BTs' job attitudes by using an insider/qualitative perspective (RO2).*

RO1 aims to take a general view of the network structure and its link to job attitudes by measuring the relationship patterns through both cohesion and centrality. In RO2, this general view is supplemented by BTs' perceptions of their network. As such, the aim is to unravel the processes through which network structure and its effects emerge.

Methods

Embedded mixed-method design

This study is based on an embedded mixed-method design (Creswell & Clarke, 2011), in which both quantitative and qualitative social network data were combined within a case study approach (see Chapter 2 Rienties, Chapter 7 Sarazin, Chapter 15 Murphy) to obtain a comprehensive understanding of the network structure of BT's primary school team and its relatedness to BTs' job attitudes. This design is used, as the central research objective requires different subgoals, which, in turn, require different types of data. The purpose of the quantitative data is to enable an outsider perspective of the network structure and its relatedness to job attitudes (RO1). The purpose of the qualitative data is to understand the network structure and its relatedness to job attitudes by exchanging the outsider for an insider view (RO2), thereby supplementing the numerical data with qualitative data and enhancing and explaining the quantitative results. By putting forward teachers' sense-making, this research goal aims to make the network structure, and its effects, more transparent.

Sample

The study took place in Flanders (Belgium) and was part of a larger research project wherein the aim was to investigate BTs (≤ five years of teaching experience) and their primary school teams (including all primary school staff with a pedagogical and/or coordinative function) over time. In this respect, the participating BTs had to teach in a primary school for an entire school year. By use of convenience sampling, ten BTs who met these requirements, and whose primary school team agreed to take part in the study, were included. These BTs, and their teams, were questioned three times throughout the school year 2016–2017 (see Table 15.1). The current study reports on the networks of the first measurement (December 2016).

<TABLE-15.1>

Research instruments

Data were collected using three research instruments, which are visualized in Figure 15.1. For RO1, which pertains to the outsider perspective, whole-school surveys and job attitude scales were used. For RO2, focusing on the insider perspective, semi-structured interviews were conducted. The whole-school surveys were administered to all team members, whereas the job attitude scales, as well as the interviews, were conducted with the BTs only, as they are the main unit of analysis. Interviewing the BTs was particularly interesting, as their attitudes and behavior mainly change based on how they perceive their network (Hommes et al., 2012).

Whole-school survey

All primary school team members were asked to fill in a whole-school survey in which they had to indicate with whom they had work-related contact during the last three months. In answering this question, the participants received a name roster in which the team members' names were enlisted (Borgatti et al., 2013). On average, 95.59% of the team members responded, exceeding the minimum response rate of 75% in SNA (Kossinets, 2006).

Job attitude scales

The BTs were also asked to fill in job attitude scales. Job satisfaction, affective organizational commitment, and intrinsic motivation to teach were measured using the scale of Caprara et al. (2003), McInerney et al. (2015), and Soenens et al. (2012) respectively. All items were rated on a five-point Likert scale, ranging from 0 (strongly disagree) to 4 (strongly agree). The scales were validated in a previous study with 292 beginning primary school teachers. They yielded adequate to good results regarding reliability (see Thomas, Tuytens, Devos, Kelchtermans, & Vanderlinde, 2018).

Semi-structured interview

Semi-structured interviews with the ten BTs were conducted. In the first part of the interviews, they were questioned about the processes underlying the team's interconnectedness and their position in the team. Regarding their position in the team (out-degree), an ego-network approach to SNA (Crossley et al., 2015) was used. Specifically, BTs' ego-network was drawn comprising of the interactions the BT (*ego*) has with the team members whom they nominated as work-related contacts (*alters*) in the whole-school survey. In discussing their work-related interactions, the focus was on the factors that helped/inhibited them to reach out to their team members. Additionally, to gain insight into the processes underlying the entire team's interconnectedness, they were also asked to report on the helpful and inhibiting factors their team experienced in connecting to one another, and to what extent their team was interrelated. In the second part, the teachers were asked to give information about their responses on the job attitude scales and their link with the network.

<FIGURE-15.1>

Analysis

Quantitative analysis

For RO1, quantitative analyses were performed. First, for cohesion, *density* and *degree centralization* were calculated, and for centrality, *normalized in-degree* and *normalized out-degree* were used, as discussed in Wasserman and Faust (1994) and Chapter 12 Laengler.

Second, the scores on the job attitude scales were analyzed descriptively, and for every BT were compared to their cohesion and centrality scores.

Qualitative analysis

For RO2, the semi-structured interviews were analyzed using NVivo. The data were categorized into two themes, parallel to the two parts of the interview. The first theme

"processes underlying network structure" was subdivided into "processes underlying cohesion" and "processes underlying centrality". In the second theme, "job attitudes"; "job satisfaction", "affective organizational commitment" and "intrinsic motivation to teach" were distinguished.

After a within-case analysis for each BT, a cross-case analysis comparing their interviews was performed (Miles & Huberman, 1994). To ensure reliability, 20% of the interviews were coded independently by the first author and an expert in qualitative research who was unfamiliar with the study. The inter-coder reliability was 92%, exceeding the threshold of 80% (Miles & Huberman, 1994).

Results

In what follows, to fully respond to both subgoals and emphasize the role of the quantitative and qualitative data in a structured way, first the results for RO1 (the outsider perspective) are presented, followed by the results for RO2 (the insider perspective). Notwithstanding the presentation of both subgoals - and as such the quantitative and qualitative results - in separate subsections, both subgoals are inextricably entwined and together aim to paint a more complete understanding of the network structure and its relatedness to job attitudes.

The outsider perspective on network structure and its relatedness to job attitudes

Concerning RO1, network structure and job attitudes were investigated from a quantitative approach. Table 15.2 provides an overview of the descriptive results.

First, the average results of the sample revealed high scores for cohesion, indicating that most school networks were quite interconnected. On average, 73% of the total number of potential relationships were present. The average degree centralization score of .30 signifies that cohesion was, to some extent, organized around particular nodes, but mainly revealed that most of the team were interconnected. For centrality, average scores were also high, with BTs

nominating 76% of the team members as people they have had work-related contact with, and 74% nominating the BT. Finally, the average scores for the job attitudes show that most BTs were satisfied, committed, and motivated to teach.

Second, BTs' scores for structural properties and job attitudes were compared with the sample's average scores. It was then assessed whether the central assumption of the study was supported, namely that high scores on structural properties were combined with high scores on job attitudes. By performing this visual inspection of the descriptive table, the following could be discerned:

(1) Various cases seemed to show support in favor of accepting the central assumption. The results revealed that for several BTs, average and high scores on structural properties were combined with average and high scores on teachers' job attitudes (e.g. Alice, Millie, Daniel, and Nina, Table 15.2). In parallel, Jasmine's centrality scores were lower compared to the sample's average (e.g. normalized out-degree=.50), and she scored lower than average on job attitudes (e.g. job satisfaction=2.25);

(2) Other cases rather seemed to show support in favor of rejecting the central assumption. In these cases, lower than average scores on structural properties were accompanied by (above) average job attitude scores (Faye and Valerie, Table 15.2). Faye had a rather low out-degree centrality (.33) and a slightly below average in-degree centrality (.67), but displayed average, and above average, job attitude scores (e.g. job satisfaction=3.50). For Valerie, compared to the average scores, her school network density was quite low (.40). Her in-degree (.53) and out-degree centrality (.53) were below average. The results revealed, however, that she scored high on job attitudes (e.g. affective organizational commitment=4). Even though caution is warranted as only ten participants are included in this study

and some descriptives appear to be centered around the mean, these results appear to indicate that–to some extent–the cases of Faye and Valerie show that high job attitudes are not always accompanied by high structural properties.

Third, examining the cases of BTs who work in two of the surveyed schools also revealed interesting findings (Josephine, Maya and John, Table 15.2). The results showed that differences in structural properties between schools often go together with differences following the same trend in job attitude scores. Josephine scored her job attitudes in both schools highly, but indicated a small difference in her job satisfaction score. The slightly higher score for job satisfaction in Oakmont Elementary was also reflected in the structural properties. Both density and normalized out-degree and in-degree scores were higher in the former. For Maya, the structural properties at Oakmont Elementary, ranged between average and high scores. For this school context, she also had (above) average job attitude scores. For Willow Elementary, her normalized in-degree and out-degree centrality were below average and some of her job attitude scores were slightly lower than for Oakmont Elementary (e.g. job satisfaction=2.75). Finally, in the case of John, the results revealed average scores for the structural properties at Ravenswood Elementary. However, for Red Mountain Elementary, specifically regarding normalized in-degree and out-degree, he scored above average. The difference in both schools was also reflected in his scores for affective organizational commitment.

In summary, the descriptive quantitative results revealed that: (1) Most of the BTs had a central position in a dense work-related collegial network and had positive feelings about their job; (2) some cases seemed to support, while others seemed to reject the central assumption that access to resources in the network is positively associated with job attitudes; and (3) BTs working in two schools with varying levels in scores on structural properties assessed their job attitudes somewhat differently.

<TABLE-15.2>

The insider perspective on network structure and its relatedness to job attitudes

In RO2, the descriptive quantitative results were supplemented by taking an insider view and analyzing teachers' perceptions on the network structure and its relatedness to job attitudes. The cases that seemed to support the central assumption that BTs' access to the network's resources is positively related to their job attitudes based on the results of RO1 are presented, followed by the cases that did not appear to support the central assumption. Finally, the cases of BTs working in two of the surveyed schools are outlined.

The cases that seemed to support the central assumption: Alice, Millie, Daniel, Nina, and Jasmine

The quantitative results revealed that Jasmine's scores for both centrality and job attitudes were below average. The interview data shed light on these scores. Specifically, the qualitative data revealed that important mechanisms for her low centrality scores were the reluctance of several colleagues to provide advice, her fear of being considered incapable when asking for help, and her classroom's isolated location. At the time of the interview, Jasmine was at home because of a burnout and she had recently decided to leave the teaching profession. She argued that she felt part of the team, but experienced a lack of support from, and contact with, several colleagues for certain issues, such as workload, which played a part in feeling less positive about the job and school.

For Alice, Millie, Daniel, and Nina, the quantitative findings showed high scores for both structural properties and job attitudes. In the interviews, they stated that their network and job attitudes are related. They stipulated that the way you feel and think about the job and the school is determined by the team and their interconnectedness.

I believe job satisfaction depends a lot on your colleagues and the team in which you end up. (...) I really believe the entire team has to be interconnected. This will make sure you stay. (Millie)

The qualitative data further revealed that for each of these teachers, their school's staffroom played an important role in facilitating work-related contact. Furthermore, their interviews shed light on the processes behind their high centrality scores. They emphasized their eagerness as BTs to actively connect with their colleagues and the team's openness to engage in work-related contact and provide support.

I don't have a problem opening up to people. Because you do have to put yourself out there in a vulnerable way when you want to ask a question. You have to dare to ask for advice, and I don't think everyone feels okay doing this. I don't mind. Maybe it's in my nature, asking for help. (Millie)

Most people have approached me from the start and have welcomed me with open arms. (Daniel)

The cases that did not appear to support the central assumption: Faye and Valerie

The quantitative results demonstrated that, similar to Jasmine, Faye had lower centrality scores. While Jasmine's job attitude scores followed the same trend, Faye's appeared quite high. The interview data revealed that her lower centrality scores can be partly explained by her part-time position. Faye's limited time spent in the school each week prevented her from having professional contact with the team members.

Because I'm not often here, it makes it harder to connect with other teachers. (...) For example, I'm sitting in the staffroom during lunch, but only for a short while because I have to rush to my other school.

Faye also explained that she is not responsible for a class of pupils. Her task is to help out another teacher by teaching half of her pupils for a couple of hours a week and supporting the teacher during some classes. For most issues, she turned to that particular teacher, as she was there every step of the way.

> *Because I don't have the sole responsibility for a classroom, I'm less inclined to ask questions to other colleagues. For instance, parent teacher conferences, a new teacher would ask colleagues for help "How do you go about it"? But I didn't have to do that, I just tagged along with Caro.*

Although work-related contact was limited for Faye, she emphasized that her colleagues were willing to help out. In this respect, knowing that she can ask for help and the prospect of a growing connection with the team appeared to have affected her job attitudes positively.

Next to Faye, Valerie's quantitative results also did not appear to support the central assumption. Quantitative SNA resulted in a low density score and centrality scores indicating that Valerie had work-related contact with about half of her colleagues. However, the results regarding job attitudes showed high scores. Valerie explained that several colleagues only work at the school for a couple of hours a week, inhibiting her and the other team members from professionally connecting with them. She further stated that there is a lot of interconnectedness between the regular team members, and that she too has contact with almost all of the colleagues who work at the school on a regular basis. She argued that the interconnectedness between and her professional collegial support relationships with these regular team members make her feel satisfied, committed, and motivated. In talking about a difficult experience last school year, she also made the statement that:

> *If that team hadn't supported me last year, I would've quit.*

The cases of BTs working in two of the surveyed schools: Josephine, Maya, and John

Josephine and Maya both teach in Oakmont and Willow Elementary. The quantitative results revealed that the team of Oakmont is slightly more interconnected. In the interview data, Josephine and Maya stipulated that at Oakmont, the entire team is more united. Josephine ascribed these differences partly to the habit of the team at Oakmont to regularly meet and connect in the staffroom. An important inhibiting factor for Maya and Josephine to connect to their team members at both Oakmont and Willow Elementary, is the lack of time because of their part-time positions in the schools. Maya articulated that

> *What I find difficult, is that because I work part-time in one school, and part-time in another, and because I only stay in one school in the morning and then I quickly have to go to the other school, that you don't have time [to connect]. Then you also have to watch the children at the playground three times, while you only spend half of the days at the school. There is not much time left to connect to people.*

Their stories also substantiated their higher centrality scores at Oakmont compared to Willow Elementary. They argued that in the former, the team members seem to be more open to connecting. Maya further added that at Willow Elementary, she lacks knowledge on the location of expertise in the team, inhibiting her to connect with them. At Oakmont Elementary, she denoted having that relational knowledge, causing her to be more inclined to connect to its members.

> *For instance, [at Oakmont] I know I need to go see Tia for artistic questions. For more creative solutions, like integrating a game in Math or French, you need to ask Eve. (…) In Oakmont, I know who to go to when I have a question.*

The high degree of openness to connect, and (for Maya) the knowledge on the location of expertise, are important reasons why both teachers rated their job attitudes towards

Oakmont as slightly more positive than towards Willow Elementary. Both would, if asked to choose, prefer to continue teaching in the former. When asked why, Maya answered:

> *It's really the team that'll get it together. (…) I think that Oakmont is a perfect example of how important the team is.*

Another BT who teaches in two of the surveyed schools is John. For John, quantitative analysis revealed similar cohesion scores in both of his schools. John confirmed this by stating that in both schools a lot of work-related contact takes place between its members. However, he nuanced that he experiences these teams and their interconnectedness differently.

> *They [Red Mountain] help each other out more spontaneously. For example, if somebody wants to switch supervision on the playground during breaks [in Ravenswood], there will be a formal e-mail and not many people will respond. In Red Mountain, you only have to mention it once in the staffroom and everything is settled.*

John's interview data also substantiated his central position in both teams. He stated to have a lot of work-related contact as he has to teach in several colleagues' classrooms in both schools. As such, contact with those colleagues is vital.

> *You don't really have another option. You have to communicate about the pupils, the lessons…(…) In my case, it's even more extreme… Because I teach in several classes, I have to make arrangements with all these teachers. If I had my own classroom, I would have to make fewer arrangements on a class level. But, in my case, it's very important that I know what my colleagues have done and what they want to achieve. To make sure your teaching is aligned.*

John further explained that he nominated more colleagues at Red Mountain compared to Ravenswood Elementary as he has more teaching hours in the former, offering him more opportunities to connect and be supported.

Finally, John substantiated the different scores for affective organizational commitment between both schools. He clarified that the difference between his experiences with, and positions in, both teams reflects how he feels and thinks about his schools. He stated that he feels good in, and is part of, both teams but is slightly more satisfied with the team at Red Mountain.

Discussion

The added value of mixed-method SNA

In social science literature, the added value of mixed-method research has been widely supported (e.g. Creswell & Clark, 2011). The central claims for the usefulness of mixing methods also apply to social network studies in general, and the study reported in this chapter in particular.

First, by combining quantitative and qualitative methods, a more thorough understanding of certain phenomena can be obtained (Creswell & Clark, 2011). In the present study, this was translated into the ability to obtain a more complete picture of the network by supplementing structural properties with subjective evaluations of the network (Crossley, 2010), as also highlighted in Chapter 15 Murphy. The combination of methods also leads to more valid results as findings from one method can confirm the findings from another (Dominiguez & Hollstein, 2014). The interviews of Alice, Millie, Daniel, and Nina, for example, appear to confirm the descriptive results regarding their high scores for structural properties and high job attitudes due to their statements that an interconnected and supported team is crucial for their feelings and thoughts about the job.

Second, mixing methods provides a focus on both the structures and processes of people's social lives (Bryman, 2006). This is also the case for SNA, in which a quantitative approach that focuses on structural patterns can be made more complete by adding a qualitative approach which looks at the processes behind the structure (Crossley, 2010). In this respect, the qualitative data showed evidence that explicating teachers' sense-making is necessary to clarify network structure (Kelchtermans, 2009). In the current study, for instance, regarding BTs' centrality, several mechanisms were revealed, such as team members' openness to connect, relational knowledge, and (lack of) time. Related to the latter, the results revealed that BTs working part-time and BTs working in two schools instead of one have less time to connect to their team members. In this respect, the lack of time due to part-time jobs appears to be an important inhibiting factor for engaging in work-related contact. For Maya and Josephine, for example, this seems to translate in lower centrality scores in Willow Elementary. However, as in Oakmont Elementary the team members are more open to connect, despite the lack of time spend in the school, their centrality scores are high.

Third, the results of one method can help explain the (un)expected results of the other (Bryman, 2006). Dominiguez and Hollstein (2014) indicate that quantitative findings rejecting a proposed assumption can be explained by adding qualitative data. Proof of this mixed-method advantage is also found in the current explorative study. For Faye, for example, low structural properties seemed to be combined with high job attitudes. This finding appeared to contradict our proposed assumption that the network structure of BTs' primary school team is positively related to their feelings and thoughts about the job and school. However, Faye's qualitative results revealed that the part-time and supportive nature of her job resulted in a lack of time to professionally interact with most team members, and, as such, negatively influenced her structural position. Knowing that her colleagues will support her if needed and having faith that contact with them will grow as the school year progresses, however, seemed

to positively influence her job attitudes. In short, the results demonstrate that network structure does not have inevitable determinate effects, but is rather influenced by underlying processes (Crossley, 2010). The merit of mixed-method research, wherein a combination of both methods can reveal intriguing results that cannot be obtained using only one approach, was also highlighted in Chapter 2, whereby 114 BTs reflected upon their established network after nine months of professional development, and indicated they used these ties for professional, emotional, and academic support (Rienties, 2019).

Limitations and guidelines for practice

Notwithstanding their advantages, the mixed-method approach and the current study are also bound by limitations, resulting in guidelines for practice. In the following paragraphs, two limitations are discussed.

First, as mixed-method studies require the collection and combination of both quantitative and qualitative data, sample sizes are often limited, restricting the feasibility of conducting statistical tests (Wald, 2014). Power analysis revealed that the limited sample size in the current study precluded the possibility of testing the statistical significance of the relationship between the structural properties and job attitudes (in the form of correlations and/or regression analyses). However, the qualitative data provided us with additional evidence concerning the relationship among these variables, by questioning the BTs thoroughly regarding this subject. In this regard, this explorative study has taken a first step to uncover the relationship between the network structure of BTs' primary school teams and BTs' job attitudes. Particularly, the descriptive table revealed cases that seem to support and cases that seem to reject the central assumption. The qualitative data uncovered the stories behind these descriptive results. This study is exploratory in nature, and to statistically confirm its results, further research using larger sample sizes is required. We therefore advise

future studies to think carefully about the required sample size and/or combination of data sources required to answer their research questions.

Second, even though the embedded mixed-method design uncovered new insights concerning the network structure of BTs' primary school teams and the link with BTs' job attitudes, the study still mainly resides within a traditional approach to SNA. The study starts from numerical data and is later supplemented by a qualitative strand. Future studies could go a step further and use a convergent parallel design for SNA, allowing equal emphasis on both quantitative and qualitative network data. These two strands could then be collected, analyzed, and merged at one time (Creswell & Clarke, 2011). In this respect, the potential of combining quantitative and qualitative social network data could reach its full impact and represent a mutually beneficial relationship in which both methods inform and strengthen the other to a greater extent. The move from a mixed-method approach in which one strand is mainly supplemental to a complementary and equal use of both approaches could yield interesting new findings concerning BTs' networks and their link to job attitudes.

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