

An Investigation of Teachers' Advice Networks and Emergent Leadership through Social Network Analysis*

Una investigación de las redes de asesoramiento docente y el liderazgo emergente a través del análisis de redes sociales

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Abstract

This research focused on the content and nature of teachers' advice networks and the process and characteristics of emergent leaders. We particularly worked on the content, frequency, and results of teachers' advice-receiving patterns as well as personal traits, competencies, and sources of power that made emergent leaders. Data were collected from the staff of three high schools located in Van, Turkey. We analyzed interview data via social network analysis software and content analysis. We found that teachers needed peer advice more on bureaucratic processes and they preferred teachers who were more experienced. Emergent leaders were high in referent, expert, information, and connection power; they were also found to be dominant in personality traits like being honest, reliable, responsible, well-intentioned, fatherly, and social.

Keywords: Teachers' Advice Relationships, Characteristics of Emergent Leaders, Teachers' Social Networks, Social Network Analysis

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Resumen

Esta investigación se centró en el contenido y la naturaleza de las redes de asesoramiento docente y el proceso y las características de los líderes emergentes. Trabajamos particularmente en el contenido, la frecuencia y los resultados de los patrones de asesoramiento de los maestros, así como en los rasgos personales, las competencias y las fuentes de poder que hicieron a los líderes emergentes. Se recopilaron datos del personal de tres escuelas secundarias ubicadas en Van, Turquía. Analizamos los datos de las entrevistas a través de un software de análisis de redes sociales y análisis de contenido. Descubrimos que los maestros necesitaban más asesoramiento de sus pares sobre los procesos burocráticos y que preferían a los maestros con más experiencia. Los líderes emergentes eran altos en referencia, expertos, información y poder de conexión; también se encontró que eran dominantes en rasgos de personalidad como ser honesto, confiable, responsable, bien intencionado, paternal y social.

Palabras clave: Relaciones de asesoramiento docente, Características de líderes emergentes, redes sociales de docentes, análisis de redes sociales

INTRODUCTION

Employees in a formal organization interact and share more with other employees to whom they feel close in some ways. Friendship groups that emerge independently of official duty and positions constitute the informal organization. Informal organizations are informal relations systems that occur spontaneously in all formal organizations and do not exist in the organizational chart. The informal structure gives rise to informal norms of behavior and informal leadership styles (Aydın, 2007; Krackhardt & Stern, 1988; Robbins, DeCenzo & Coulter, 2013). Likewise, education staff who interact face to face within their school create a social network. A social network simply consists of actors and their relations (Carolan, 2014; Wasserman & Faust, 1994). Relationships between educators are shaped by factors such as friendship, advisory relationships, knowledge sharing, similarity of character, gender, teaching grade, and common interests as well as their role in the formal structure (Borgatti, Everett & Johnson, 2013; Carolan, 2014; Geeraerts, Vanhoof & Van den Bossche, 2018; Ortega *et al.*, 2020).

Whether at group level or whole school level, there are teachers with whom other teachers communicate more, care about their opinions and seek advice from them on professional topics. These advisory teachers get ties (links) from their colleagues seeking advice. Hence there occurs a dyadic information sharing relationship between two or more actors. Teachers receiving the greatest number of ties are placed in the center of social network, become a star of the network, and are seen as sources of information by which they can affect their colleague teachers' opinions and behaviors (Borgatti, Everett & Johnson,

2013; Emery, Calvard and Pierce, 2013; Marion *et al.*, 2016; Siciliano, 2017). They have influencing power arising from their individual characteristics, experience, knowledge or social relationships. As they have informal influence, these teachers who are seen as emergent or informal leaders, are important for the integration or segregation of school community as regards school development programs and related reform implementation (Balkundi and Kilduff, 2006; Pitts and Spillane, 2009).

From a network perspective, relationships between teachers are seen as an important element for the school to fulfill its function more effectively and as a potential resource in school improvement efforts (Daly and Finnigan, 2009). Studies have shown that relationships between teachers are important in creating strong school communities (Penuel *et al.*, 2009), and that strong social relationships within and between schools play a vital role in policy implementation and instructional change by enabling mobilization of information and resources (Coburn and Russell, 2008; Daly and Finnigan, 2009; Moolenaar, 2012). Moolenaar, Slegers, and Daly (2012) argued that intensely connected teacher networks have the power of collective influence, especially in the exchange of advice and information, and this supports student success. Ortega *et al.* (2020) stress that the capital in the form of expertise and information that is critical for teachers' professional development and capacity building in school travels via personal interactions across teachers' networks. Thus, understanding the functions and results of these relational structures is of critical importance also for information sharing to take place between teachers from different generations (Geeraerts, Vanhoof and Van den Bossche, 2018).

Apart from revealing the structure and content of relationships, Balkundi and Kilduff (2006) emphasize that social network analysis also enables the identification of emergent informal groups and informal leaders, and how important formal leaders' relationships with these informal leaders are for organizational success. Penuel *et al.* (2010) state that if the formal and informal organizations and interactions of a school are well aligned, it will be easier for the faculty to initiate and sustain instructional change. Researchers (Spillane, Shirrel and Adhikari, 2018; Woodland and Mazur, 2019) suggest that informal and formal interactions are a key component of teacher collaboration and organizational design should enable teachers to access peers' instructional support through the network. Hence, in order to direct informal groups within the school in a way that will contribute to cohesion, collective learning and successful implementation of reform and development programs, it is important to bring forth the informal leaders who are important actors in the social structure, their personal qualities and the power types these leaders use in influencing their colleagues.

The aim of this study is to investigate the organizational advice-seeking patterns, the content of advice networks, personal qualities and sources of power contributing to the emergence of informal leaders within school's advice network. Our lead research question

is: By which characteristics and sources of power do some teachers influence their colleagues and emerge as informal leaders within school's advice network? We will also shed light on patterns of teachers' advice-seeking behaviors focusing on the frequency, content, and benefits of advices received from their peers.

Although literature offers some information about informal leadership in different organizations, there are very few studies on the emergence of informal leaders in schools using social network analysis methods. This study uses social network analysis to determine informal leaders, deploys qualitative content analysis to describe what personal characteristics make informal leaders, and aligns those characteristics with proper types/sources of power, and through this blend, our study is almost unique. Studying Turkish schools, we would like to contribute to the emergent leadership literature by presenting valuable network data about informal groups, information sharing channels, and influential actors.

THEORETICAL FRAME

This part is organized in a way to mention first about social network analysis and the alignment of emergent informal leadership research with network analysis. Next, we will take a look at the emergent leadership and bring forth some relevant studies. Finally, we will be analyzing the sources of power that informal leaders exercise for influence.

1. Social Network Analysis as a Lens to Study Emergent Leadership

This study takes a network perspective into investigating the structure, content and relationship patterns in advice networks through analyzing information-seeking ties among the education staff working face-to-face in the same building. In this regard, a social network can be defined as a certain number of education staff (actors) and the relationships (ties) among these staff. Carolan (2014) states that basically a network consists of a set of actors, their individual characteristics and at least one relationship. Social network analysis focuses on relationships and is a sociometric method that maps and studies interpersonal relationships in formal and informal networks (Daly and Finnigan, 2009; Freeman, 2004; Scott, 2000).

Social network theory is a field of study that explains how people, organizations or groups interact within their networks focusing on the patterns of interaction, the relational dependence between individuals and the effects of this dependence on the behavior of individuals (William and Durrance, 2008). From network perspective, individuals are not independent from each other, but are connected to other individuals through various ties and relationships. This dependency created by relationships affects the outcomes of individuals (Borgatti, Everett and Johnson, 2013; Robins, 2015; Wasserman and Faust, 1994).

As leadership is a process of communication and social interaction between leader and followers, they develop mutual relationship patterns. Hence, social network analysis offers important opportunities to study shared and emergent leadership as it models patterns of relationships between connected individuals and shows how leadership is distributed among group members and identifies the emergence of multiple informal leaders (Carson *et al.*, 2007; Mehra *et al.*, 2006, quoted in Emery, Calvard and Pierce, 2013: 5-6; Pitts and Spillane, 2009). Network analysis examines the networks of interacting actors and identifies informal leadership roles performed by different actors. That is to say, some individuals are seen as informal leaders because they have positions (betweenness centrality) that affect communication and flow between actors. Some actors may become a hub (information centrality) in obtaining, processing and distributing information with their position in the network (Borgatti, Everett and Johnson, 2013; Marion *et al.*, 2016; Pitts and Spillane, 2009).

In a leadership network, actors and ties image group members and their leadership perceptions. At the dyadic level, the leader is separated from the follower by the direction of ties. Namely, the follower establishes the tie with the leader and nominates him for leadership; the leader becomes the addressee of the tie and collects the votes of others. At the group level, emergent leaders are identified as the ones who have the greatest number of votes (ties). Therefore, network design sees leadership as a group process in which there are followers designating one or more leaders (Emery, Calvard and Pierce, 2013).

Based on a network perspective and to reflect the social (informal) reality as much as possible, we propose to identify an emergent leader as an influential actor who received more information-seeking ties and thus had an opportunity to influence other actors independent of formal title or positions. That's why we use emergent leadership and informal leadership interchangeably as schools like many organizations do operate via informal settings, interactions, and communication.

2. Emergent Leadership Studies

Leadership has been defined in different ways in terms of personal qualities, behaviors, influencing processes, interaction models, role relationships and managerial positions (Yukl, 2010). Northouse (2010, p.3) defined leadership as 'a process whereby an individual influences a group of individuals to achieve a common goal'. According to Yukl (2010, p. 26), 'Leadership is a process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives'.

Hackman and Johnson (2013), who consider leadership as an activity on the basis of communication, attributes effective leadership to the development of interpersonal

communication skills and the willingness to communicate. According to them, leaders who are skilled in communication affect other individuals more easily. Based on these definitions, it can be said that leadership occurs as a process and in the interactions between the leader and the audience. Leader and members affect each other in these interactions between individuals or within the group (Northouse, 2010; Yukl, 2010).

Northouse (2010, p.5), explains that assigned leaders are leaders in a position within the organization and draw their power from the formal organization hierarchy. An emergent leader, on the other hand, is a member who does not have any managerial title or position, but is supported and appreciated by group members and thus has the potential to influence. Emergent leadership occurs through communication in a dynamic process. In this process, the personal characteristics, knowledge and experiences of the leader and followers, as well as the current situation, affect the leadership behavior.

Studying the personal characteristics of emergent leaders, Smith and Foti (1998, cited in Northouse, 2010, p.6) found that people who were more dominant, more intelligent, and more confident of their self-efficacy were seen as leaders by other members of the group. Fisher (1974, cited in Northouse, 2010, p.6) emphasized positive communication in the emergence of leadership and listed verbal ability, being knowledgeable, taking the opinions of others, developing new ideas and being determined as elements that improve communication.

Emery, Calvard and Pierce (2013) carried out a study to explore if & how Big Five personality traits determined leadership emergence through receiver and sender ties. They studied the social network of a group which did not have a leader. The group consisted of 41 college students whose participation was assessed three times during the study. Researchers found that individuals who scored higher on agreeableness, extraversion, openness to experience and conscientiousness were more likely to emerge as task and relationship-based leaders.

Stincelli and Baghurst (2014) searched to explore the informal leadership qualities based on the perceptions of 28 employees and 13 managing staff in a small organization in the States. They collected data with 9 open-ended questions and analyzed data to find that individual competence, organizational culture and situational requirements were three main themes regarding emergence of informal leadership. More detailed, they listed confidence, ability, knowledge, willingness, example, and influence as sub-themes of individual competence. Likewise; ideas, asking, encouragement, and opportunities were sub-themes of organizational culture. Lastly, situational requirements included ability, company, goals, organization, skills, effectiveness and team as sub-themes.

Stating that informal leaders do not have official managerial positions and authority, Pielstick (2000) studied the variables that differentiate the formal leader and the emergent (informal) leader. In this context, the variables in which informal leaders were most evident

were honesty, reliability, being fair, being humorous, treating everyone with respect, supporting gender equality, acting ethically and showing interest. Informal leaders took time to listen, were open to sharing and appreciated more.

Karaman (2015) studied social network analysis and emergent leadership processes in her master's thesis. The researcher, examining the advice network data obtained from students in a public university with social network analysis, determined that the leader assigned within the formal organization and the emergent (informal) leader are different individuals according to the measures of core-periphery formations, density, centrality and betweenness. The researcher attributed this differentiation to various reasons including personality traits, social and emotional intelligence, positive communication and relationships.

Lovelace (2019) designed a phenomenological study to explore how formal and informal teacher leaders influenced teacher attitudes, beliefs, and pedagogy. Participants of the study were thirty K-12 classroom teachers selected from three school districts. It was found that by the researcher that teachers sought advice from teacher leaders who were knowledgeable, willing to help, student-focused and also experienced. Thus, teacher leaders enhanced teachers' pedagogy. The researcher also found that teacher leaders shaped teacher attitudes and beliefs about their individual school cultures.

Based on advice network data collected from 660 teachers in Belgium, researchers (Geeraerts, Vanhoof, and Van den Bossche, 2018) found that older teachers with more years in teaching were asked for their expertise on subject matter and classroom management whereas young teachers were asked for advice on ICT.

Ortega et al. (2020) found that individual similarities like friendships affected advice relations and teachers mostly went to the peers teaching the same subject and to colleagues having formal organizational roles such as principals. Advice interactions were somewhat aligned with formal structure. Moreover, they found that independent of formal roles and individual attributes, some teachers were more popular as source of advice. Their study included advice networks of six secondary schools.

Finally, Kahraman, Sözen, and Meydan (2012) studying the position and opportunities of the leader via social network analysis found that the leader was positioned at the core of the network. Identifying the informal leader through interactions between actors, the researchers concluded that the formal leader and the informal leader were not always the same person.

3. Emergent Leaders' Sources of Power

Leadership cannot exist without influencing processes. Because the leader has to influence the efforts, attitudes, thoughts and behaviors of people in order to ensure that they work in line with the determined goals. Therefore, one of the basic components of

leadership is ability to influence. In order to influence employees, the leader must have power. According to Yukl (2010, p.199), power is the capacity of an individual to influence the attitudes and behaviors of other target (s) in a desired way at a certain point in time.

The leader can derive power from both his personal qualities and his legal position. According to the dual conceptualization of the source of power, power is derived partly from the individual's official position within organization and partly from individual's qualities and relationships with others. Position power includes the potential impact derived from legal authority, resources, rewards, penalties, control over information and the physical work environment. However, personal power symbolizes the potential impact based on work experience, friendship and loyalty (Yukl, 2010).

French and Raven (1959) divided the power sources that leaders will use to influence their followers into five groups. These are legitimate power, reward power and coercive power within the scope of position power; expert and referent power under the personal power category. In addition to these common types of power, information power and relationship (connection) power (Bal *et al.*, 2008; Lauby, 2012) are listed in different studies.

Legitimate (position) power is the power that comes from the leader's formal authority within the organization and is based on the relationship between offices rather than individuals (French and Raven, 1959). It is related to the job title and the responsibilities based on legal rules within the hierarchical structure of the organization. This type of power is seen more in bureaucracy as written orders or instructions (Lauby, 2012; Lunenberg, 2012). Principals and vice principals in a school gain access to this power upon appointment or assignment (Bal *et al.*, 2008).

Sub-types of legitimate power, reward power is related to the ability to recognize employees who act in accordance with organizational expectations and standards and to reward them with resources within the organization (Bal *et al.*, 2008) while coercive power is the power of administrators who are in a position to punish in the organizational hierarchy (Lauby, 2012). It aims to fulfill the organizational responsibilities of employees who do not reach the organization's expectation standards through warning, threat or punishment (French and Raven, 1959; Yukl, 2010).

As a type of personal power, expert power includes knowledge and skills related to the job. The unique knowledge of a potential leader to do a job best or solve a problem has an impact on followers, colleagues and top managers. However, experience becomes an important source of strength if other people need advice. It is not enough for the potential leader to have experience alone. Followers should notice this experience and see the leader as a reliable source of advice and information (Lauby, 2012; Lunenberg, 2012; Yukl, 2010).

Referent power, also expressed as charismatic power, refers to the leader's potential to influence his followers with his personality traits (Bal *et al.*, 2008; Lunenberg, 2012). It is

the personal power of the leader to be loved by his followers and to be popular among them, without formal authority (Lauby, 2012). The power of reference is associated with strong love, identification, admiration and loyalty (French and Raven, 1959) This type of power is higher in those who are friendly, attractive, impressive and reliable. Reference power is increased by dealing with the needs and feelings of others, showing trust and respect, and treating people fairly (Yukl, 2010).

Information power refers to access to important information that other individuals cannot access and control in spreading this information (Pettigrew, 1972, cited in Yukl, 2010, p.210). The power of knowledge is the control skill that emerges from the evidence that a person uses while developing arguments or in discussions (Bal *et al.*, 2008). Leaders with high knowledge power reach a high level of influencing power due to access to the information that others need or deem important (Lauby, 2012). Partial access to information stems from the person's position in the organization's network. Managerial positions often provide opportunities to obtain information that other employees cannot directly access (Mintzberg, 1983, cited in Yukl, 2010:210).

Another type of power identified by researchers is that of relationships. Connection power is the ability to save and influence benefits such as resources and information that a person can obtain through social connections with other people (Lauby, 2012). Connection power is the potential for leaders to influence within and outside the organization through their formal or natural networks (Bal *et al.*, 2008).

Power is not static and changes over time according to circumstances and the actions of individuals and coalitions. The amount of status and power attributed to the individual is proportional to the group's assessment of that individual's potential contribution relative to that of other members. The contribution may be control over scarce resources, access to critical information, and skills to accomplish a difficult task (Yukl, 2010).

MATERIALS AND METHODS

Design

This study was designed as a multi-case study research which aimed to make three high schools' advice networks and emergent leaders more visible. What makes the case study powerful is that the situation is observed in its real environment. The unique and variable environment is a powerful and important determinant on both cause and effect (Cohen, Manion and Morrison, 2007). Case studies offer rich and varied descriptions of phenomena based on the perceptions of individuals or groups. With rich data, events and situations are given the opportunity to tell about themselves. From this perspective, case studies investigate and report complex and dynamic human relationships and the interaction between events (Cohen, Manion and Morrison, 2007; Yin, 2009).

Participants

Within the scope of the research, there are teachers and (vice) principals working in three high schools, namely a vocational high school, a religious studies high school and a general high school, located in the central districts of Van, Turkey. We wanted to investigate the possible common and different network structures and leadership emergence patterns among the three schools, so selected schools which were implementing different curricula. Hence, among the purposeful sampling methods, maximum variation sampling type was preferred in the selection of schools. According to Patton (2001), purposeful sampling enables in-depth study of situations with rich information. Maximum diversity as sampling type reveals differences between situations by selecting and studying heterogeneous situations (Patton, 2001).

Due to the confidentiality promise given to the participants by the interview protocol during data collection phase and to eliminate privacy worries of the participants (Lange, Agneessens and Waege, 2004), the real and full names of these high schools were not given. High schools are mentioned only by their program type. In addition, in order to protect the confidentiality of personal data, codes were attributed to participants and these codes were used instead of participant names. In all data collection, editing, analysis and reporting processes, codes were used instead of school types and participant names.

As for participation rates, there were 23 education staff on active duty in the technical school and 23 (100%) of them participated. For the religious studies school, the number of staff on duty was 30 and 26 (87%) of them took part in the research. Finally, in the general school the number of staff was 31 and data was collected from 29 (94%) of them. The average participation rate of the three schools is roughly 94%, with the lowest participation rate being 87%. Moolenaar (2012) advised that participation should be higher than 80% regarding the optimal analysis of relationship patterns in a network research.

For those participants who did not want a recorded interview, we offered them to fill out the form by writing. Researchers tried hard to convince all participants to take part in the study and express their answers on all items and questions as it is important to collect data from as many participants as possible to have a comprehensive and robust analysis of networks.

Instrument

Advise network data were collected by the semi-structured Social Network Study Interview Form developed by the researchers. Open-ended and closed-ended questions were included together in the interview form. According to Berg (2001), the questions used in semi-structured interviews allow researchers to see the world through the eyes of the participant. This study is based on the data collected through questions in the third part of

the interview form. Here, teachers and administrators were requested to comment on which matters they needed advice, if the advice worked for them, to which colleague they went for advice and why they chose that person. This part illustrated the school's advice network and the informal leadership structure of the concerned school.

Data Collection

Face-to-face interview was preferred as the data collection technique in order for the participants to feel comfortable and express their opinions freely without any concern (Creswell, 2012). The interviews were conducted in schools and took place between February and June 2016 after obtaining official research permissions from the district education authority. First, the school principal was informed about the research, and the list of staff was requested and marked with a code assigned to each name. Then, in the teachers' room, teachers were informed about the purpose of the research, interview, data analysis, confidentiality, and they were encouraged to participate in the study.

Prior to the one-on-one interviews, the interview protocol, purpose of the research, sort of questions, analysis and confidentiality issues were mentioned again, and it was explained that the purpose of using the audio recording device was to record all comments and to transcribe these records afterwards, and verbal consent was obtained from the participant to begin the interview. The previously coded staff list was given to the participant to be used while answering network questions and it was stated that only codes should be given, not real names. The list helped the participant teacher to see all the staff in the school clearly, thus remember all the candidates and make the right choice as much as possible by reducing the cognitive load.

Data Organization and Analysis

Recorded interviews were transcribed into an MS Excel file per school for network and content analyses (Cohen, Manion and Morrison, 2007; Creswell, 2012). For analysis, network data were converted to matrices. Rows and columns of each matrix consisted the same actors. Rows represented sending ties while columns indicated receiving ties. We used 1 to symbolize an existing tie between each pair of actors and 0 for non-present ties (Carolan, 2014; Scott, 2000). So, to show that actor A1 went to A2 to seek advice, we added 1 to the intersecting cell between A1 (row) and A2 (column). Later, each matrix was exported to and analyzed with Ucinet 6.0 (Borgatti, Everett and Freeman, 2002).

In social network analysis, centrality measures are widely used to identify central actors occupying prestigious or important positions in the network. Of them, we used the in-degree centrality and betweenness centrality. In-degree centrality denotes the number of direct choices received. It is a measure to find which actors received the most votes

or ties, earning them popularity and prestige. Similarly, betweenness centrality reveals the intermediary positions that can control resources in the networks. Actors with high betweenness centrality scores can facilitate or hinder flow of resources such as information. For standard assessment, analysis outputs are given as normalized values ranging from 0 to 1, and 1 signals the highest degree of centralization (Borgatti, Everett and Johnson, 2013; Carolan, 2014; Robins, 2015). Network analysis allowed us to see central actors based on their ties and proportional standing. Actors receiving more advice-seeking ties gained popularity and prestige and thus became the star of the network, namely, the emergent informal leader. To display the network and central actors visually, a sociogram (map of relationships) of each network was created using Net Draw (Borgatti, 2002).

Finally, for each school, teachers' responses about the content of advice network and stars of their network were analysed through content analysis, which was carried out at word and sentence level. A distinctive code was used for each statement while attention was paid to word frequencies and similarity of meaning. Thus, categorical themes were obtained by grouping similar expressions.

RESULTS

This researched aimed to find patterns in information-seeking behaviors of teachers in advice networks, paying attention to what topics teachers needed advice, how often they went to a colleague for advice, if the received advice worked effectively, to whom they went for advice and why they preferred that person. To reveal patterns and avoid repetition, we presented findings in a way that included and summarized 3 schools together. However, we processed a separate analysis of advice networks and informal leadership emergence per school including sociograms and structural statistics.

Common Findings about Advice Networks

As rationally expected, it was seen that same-subject teachers first initiated a consultation relation with each other on subject matters, with the senior one being more consulted. As a pattern, teachers often went to the school administration team in legislative and bureaucratic procedures, to school counselors about student behavior and orientation, and to informatics teachers in using interactive boards and other technological (ICT) issues.

In addition, we found that different evaluation criteria were used by teachers in determining whom to go for advice. The criteria teachers considered in finding an addressee while seeking advice can be given as "subject matter and social closeness", "having knowledge about the subject", "being accessible (at that moment)", "having more experience", "field

of duty/responsibility”, “knowing students well”. This shows teachers continuously observe and evaluate their colleagues at work and finally decide on whom to go for advice to solve problems.

Table 1:
Frequency of teachers' advice seeking, 2016 (source: own calculation)

Time Interval	f	%
Almost everyday	0	0
Several times a week	11	13
Several times a month	33	39
Several times a term	15	18
Several times a year	7	8

According to table 1, teachers consult their colleagues at varying degrees of frequency and there was no teacher who went for advice every day of school. The highest frequency revealing a pattern for advice network is that one third of teachers got advice from their colleagues “several times a month”. However, 19 (22%) participants did not specify any interval saying it depended on the topic mostly and also that teachers talked about matters/advices during daily dialogues.

Table 2:
Topics that teachers sought advice about, 2016 (own calculation)

Major topics on which teachers sought advice	f
Legislation, regulations and directives	25
Paperwork (unit/lesson plans, reports, minutes of meeting, official documents)	16
Bad student behavior and student guidance	16
Use of interactive boards and related technology	15
Classroom management and teaching techniques	14
Curriculum, planning of courses and exams	6

Table 2 shows that one of the major topics that drove teacher for advice is the official bureaucratic procedures like the legislation and directives which form the legal part of educational settings. Second on the list is the paper work that teachers need to do such as yearly and monthly course plans, student performance evaluations, exam preparation, minutes of departmental meetings and course assessment reports. Third on the list is the poor student behavior and developing tactics to handle and direct them for better results.

Teachers' Reviews about the Benefits of Advice They Got

It was seen that teachers benefited from the advices they received from their colleagues. They evaluated the results they had achieved positively. Among the most mentioned outcomes of the advice-taking relationship were “learning the legislation and paperwork”, “exchanging ideas”, “solving problems”, “transferring useful methods”, “contributing to professional development”, “feeling more comfortable and safe”, “being able to look from a different perspective” and “development of communication”.

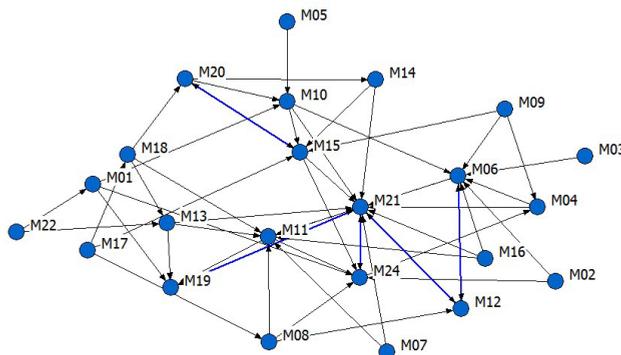
As regards whether collegial advice worked or not, 40 (48 %) participants interpreted the effectiveness of received advice as “at high level” and 19 (23 %) participants as “at medium level” in solving problems or bringing out a solution.

Analysis of the Technical School's Advice Network

Technical school's advice network consists of 23 actors and 56 links. Circles denote teachers (actors) and arrows show the direction of the tie revealing who went to whom for advice. The majority of ties are one-way clearly indicating an information-seeking act. Actors in the network are in contact with at least one actor.

When Figure 1 is examined, it is seen that there is no actor who does not share a tie with other actors in the network and is isolated. It can be noticed that actors with a single or fewer number of links are located at the periphery (edges) of the network. In the center (core), it is striking that there are actors who have received relatively more ties and thus gained popularity, ultimately becoming stars. Popular (central) actors M21, M06 and M11 received 12, 7 and 6 links, respectively, which indicate the number of actors who consulted them to get advice.

Figure 1:
Technical School's Advice Network, 2016 (source: own presentation)



The indegree measures produced by UCINET also confirm that actors M21 (0.545), M06 (0.318), M24 (0.273), M11 (0.273) are the stars of the advice network. To narrow down the topic, save on space and avoid repetition of findings and comments, we focused on the most popular two actors; M21 and M06.

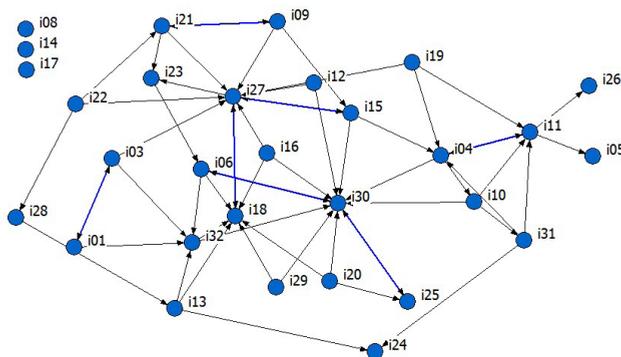
Based on data on their attributes, it is immediately striking that these stars have longer term of office at school and they are seniors in the profession. M21 had 24 years of teaching experience, 8 of which was completed at current school. Similarly, M06 had been a teacher for 16 years, and 8 years of this period passed at this school. M24 worked as a principal at current school for 6 years and in the meantime M06 was an assistant principal for 4 years. In this case, during many years of tenure those actors acquired knowledge and skills enriching their experiences. Therefore, they were seen as a trusted source of advice.

Analysis of the Religious Studies School's Advice Network

Figure 2 displays that there are total of 30 actors and 59 links between these actors in the advice network of religious studies high school. As immediately noticed, the actors I08, I14 and I17 are displayed as a separate cluster standing in the upper left corner. These three actors did not participate in the research, nor did they get a tie from other actors.

On the contrary, actors I30, I27 and I18 are placed in the center (core) as they have received the greatest number of links from other actors in the network. The actor i30 can be seen as the most influential player with 10 ties directed towards him. Being the second key player, actor i27 has 9 ties. Finally, i18 comes third with 7 ties. Their indegree values are .345, .310 and .241 respectively.

Figure 2:
Religious Studies School's Advice Network, 2016 (source: own presentation)

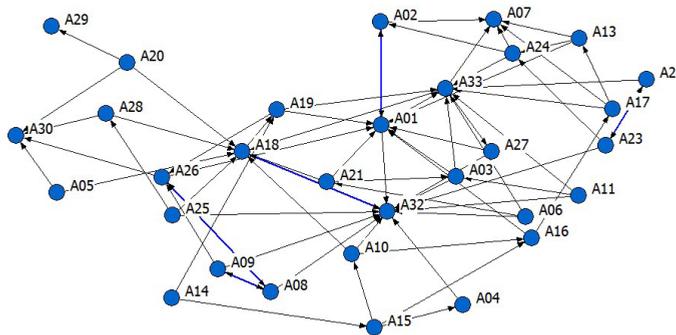


Very similar to technical school's network structure, it is seen that the actors I18 and I30 have longer term of office in the profession; 15 and 21 years respectively. I30 also has an administrative post as an assistant principal. Likewise, actor i27 has been at school for 9 years, which is a longer period than that of many other actors. In this case, tenure and seniority which enabled accumulation of useful knowledge and skills provided a great advantage to these 3 leading actors as a source of advice.

Analysis of the General School's Advice Network

The general school's advice network (figure 3) consist of 31 actors and 72 links between them. The leading actors are A32 (12 ties), A33 (8 ties), A01 (8 ties), and A18 (8 ties) located in the center of the network. Actor A32 has been a vice principal for a year and is a 4 year-teacher. A33 is the school principal who has 19 years of teaching, 6 of which was completed at current school. A18 has been a teacher for 17 years and served as an assistant principal for 3 years but returned to teaching again at this school. The actor A01 attracted a high level of attention despite being a new teacher. It is his teaching subject (ICT) that provides this. A01 is the only reference for interactive boards and technical support.

Figure 3:
General School's Advice Network, 2016 (source: own presentation)



Considering the three networks and their stars, it is seen that central actors who occupy key strategic locations in terms of information sharing, transfer of experiences and flow of resources have influence and power over other actors and thus informal leadership emerge. It can be conferred that these leading actors have information that is valuable to other actors in the network and thus they attract ties which show they are considered a source of information. By getting more ties (information-seeking links), they gain popularity as

advisors and are placed at the center. Thus, these influential actors have the ability to control the production and transfer of information and resources which are essential for effective management, learning community-building and sustainability.

Almost all stated leading actors have long term of office as teachers which enabled them to accumulate information, experiences and expertise over the years. Their knowledge and skills have provided them with a kind of credit (legitimacy) and they have gained an authority with the advisory role assigned to them by follower actors. These actors are regarded as sources of information and problem solvers by information-seeking actors, and they have the opportunity to control the circulation of information and resources in the network.

Emergent Leaders' Personal Qualities & Sources of Power

In this part, we analyzed personal characteristics and attributes as well as sources of power that helped teachers emerge as informal leaders. We selected one leader from each network, particularly the most popular actor with the greatest number of ties s/he received. In the tables below, we categorized similar statements about the leading actors under the same sub-theme, stated in brackets the actor who said it, and suggested the most relevant source of power for that group of mentioned statements.

Table 3:

Perceptions about M21 as an emergent leader, 2016 (source: own presentation)

How other actors perceived M21
Theme 1: Personal trait (Leadership role-modeling; exempling) Power: Referent
He makes you feel leadership with his actions and behavior. (M02)
From a human aspect, he is a leader. (M04)
He is so respectable. He is exemplified as a model human. (M09)
He is appreciated in terms of personality (M10)
He is the person who first exhibits things (behaviours) he wants from people (M14)
Theme 2: Competence (Knowledge of school management) Power: Expert/Information
He is knowledgeable about management issues. (M04)
He is knowledgeable about management issues. (M05)
He has experience in school management. (M19)
He is experienced and knows about the past of the school. (M24)
Theme 3: Competence (Problem-solving) Power: Information/Expert
He will for sure try to find a solution. (M04)
He finds solutions to problems (M12)

How other actors perceived M21
Theme 4: Personal traits (Tolerant, well-intentioned, fatherly) Power: Referent
He is tolerant and knowledgeable. (M03)
He is well-intentioned, he can solve misunderstandings. (M08)
He is fatherly, is appreciated and accepted. (M15)
Theme 5: Personal traits (sincerity, sense of duty) / Power: Referent
He is sincere, experienced and does his job well. (M10)
He is personally appreciated, sincere, experienced. (M18)
Theme 6: Competence (experience in teaching) Power: Expert/Referent
He is senior, is respected and has authority. (M03)
He is the most experienced person. (M05)
He is experienced. (M07)
He is senior, is respected. We ask for his opinions. (M11)
People ask for his ideas. (M02)
Theme 7: Personal traits (just, fair, honest) Power: Referent
He behaves everyone equally and fairly. He differentiates between the right and wrong doers. (M17)
He is honest and well-intentioned, makes impartial evaluations. (M06)
Theme 8: Personal traits (open to communication, social) Power: Referent/Connection
He has good human relations. (M19)
He is appreciated in terms of human relations, understanding, honesty and attitude. (M12)
He is knowledgeable, dignified and has good human relations. (M20)

Table 3 shows that actor M21 has fundamentally emerged as an informal leader through his personality traits all of which led to his being perceived as a leader model directly. M21 is high in such personality traits as being tolerant, well-intentioned, fatherly (caring, affectionate), sincere, just, fair, honest, open to communication and social. Thus, he had a strong referent (charisma) power over other staff. As for competences, he was seen as a problem-solver through his experience and knowledge both in teaching and school administration. From competence perspective, he was high in expert, information and connection power.

Table 4:

Perceptions about I30 as an emergent leader, 2016 (source: own presentation)

How other actors perceived I30
Theme 1: Competence (Experience and knowledge) Power: Expert/Information
He is experienced. (i03)
He is experienced (i11)
He is knowledgeable, experienced and helpful. (i15)

How other actors perceived I30
Theme 2: Personal traits (open to communication, social) Power: Referent/Connection
He has good human relations. (i04)
He has good human relations. (i20)
He has good human relations, takes initiative. (i31)
Theme 3: Organizational position and Competence. Power: Position/Expert
He relaxes people due to his position and personality. (i04)
He seems natural as an assistant principal. (i06)
He is a manager, as a habit we go directly to him. (i10)
He is a good administrator and knows the legislation well. (i12)
He is an administrator and ensures coordination. (i16)
He is like the imam of the rosary. (i18)
He is a competent administrator in terms of legislation. (i20)
He is good at bureaucratic work and maintaining discipline (i22)
He is good at administrative matters. (i24)
He knows a lot about bureaucratic affairs thanks to his experience as a vice administrator. (i32)
I appreciate him as a vice administrator. (i28)
He is the last person to ultimately solve school's problems. (i29)
He has disciplinary effect over students. (i18)
Theme 4 Personal traits (positive character) Power: Referent
He has a mature personality. (i04)
He has a positive character. (i06)
Theme 5: Competence (problem-solving) / Power: Information
He is reconciling, trying to find a middle way. (i09)
He is solution-oriented and humane. (i10)
He solves problems and is experienced. (i25)
He looks at matters from different perspectives. (i20)
Theme 6: Personal traits (fatherly, appreciating) Power: Referent
He is considerate, fatherly one. (i11)
He values the other person, approaches matters positively. (i25)

Table 4 shows that the actor I30 made a good harmony of his position, personality and competences. It is seen that his position contributed to his emergence as a source of advice and leader. He was seen a competent vice principal with a sense of duty and knowledge of administrative issues. He was experienced in teaching and administration, thus he developed problem-solving and coordinating skills. As for personality traits, he was seen as open to communication, social, humane, fatherly, and appreciating with a positive

character. So, he had position (legitimate) power supported by expert, information, and referent power.

Table 5:

Perceptions about A32 as an emergent leader, 2016 (source: own presentation)

How other actors perceive A32
Theme 1: Organizational position and competence. Power: Position/Expert
He is a vice principal and has good relations. (A03)
He knows well about legislation due to his duty, is experienced (A06)
He is a vice principal. (A08)
He is an administrator and has knowledge of legislation. (A09)
He has knowledge of legislation. (A10)
He is a vice principal. (A10)
Theme 2: Personal Traits (Role-model, helpful, good listener). Power: Referent
He is a leader who solves problems and gets his words across. (A01)
He helps and his advice is constructive. (A04)
He cares about my opinions, he's a good listener. (A07)
Theme 3: Personal traits (reliable, honest, responsible) Power: Referent
He gives me confidence. I can count on his ideas. (A06)
He gave confidence to me, will do what is good for me. (A08)
Takes responsibility, is honest. (A13)
He does his job on time. (A26)
I think he is reliable. I haven't witnessed any hurtful act by him. (A27)
Theme 4: Personal traits (Open to communication, social) Power: Referent
A person who communicates well and can cooperate. (A10)
He communicates with everyone, can be a reconciling person. (A16)

Table 5 shows that actor A32 emerged as a leader partly thanks to his position and was seen to have good knowledge of administrative procedures. Thus, he exercised leadership basically through position power. It can also be said that he could solve problems with active communication skills. Moreover, he was perceived to have personality traits like being helpful, good-listener, reliable, honest and responsible with a sense of duty. Hence, he displayed referent power to influence other actors.

DISCUSSION

This research sought to examine the advice networks of three schools paying attention to core and periphery formations including central actors' indegree measures making them

emergent leaders. Attention was also paid to how often and on which topics teachers sought collegial advice, whether the received advice proved working, via which personal traits and competences central actors were perceived as leaders by their colleagues at school.

First, we found that teachers were continuously observing and evaluating their colleagues in terms of personality, openness to dialogue, willingness to help, expertise and competences. They initiated advice-receiving relationships with the advisory colleagues based on some criteria such as teaching (same) subject, organizational position, accessibility for that moment, expertise and knowledge about subject matter, profession or school community. Teachers with a longer period of time at school and more years in teaching were more likely to be perceived as experienced. Our finding is in conformity with those of Spillane, Shirrel and Adhikari (2018) who suggested that school settings enabled teachers to see and identify their peers and that perceptions of a peer's expertise influenced whom school staff sought out for advice about instruction. Likewise, Siciliano (2017) found advice-receiving became convenient when teachers perceived a colleague as accessible and willing to provide information in a timely manner. Additionally, Ortega et al. (2020) found that teachers turned to their peers teaching the same subjects and to the staff with formal roles such as school leaders for support and advice.

Second, it was found that teachers needed advice more on legislation, regulations and official paperwork. Hence, it could be concluded that teachers did not often search for advice directly related to their classroom teaching or pedagogies. As for the frequency of advice-receiving pattern, more than 60 % of teachers sought collegial advice several times a month or less frequently, which drew us to infer that teachers were not much interested in asking for advice from their peers. However, teachers who received peer advice, found the consequences of advice-receiving as beneficial contributing to learning the paperwork, solving problems, exchanging ideas, feeling more comfortable and improving dialogue among teachers.

In term of the structure of advice networks, we saw that actors who received more ties were located in the center of the network formation and thus were nominated as emergent leaders by other actors in the network while those actors with fewer number of ties were on the periphery showing there were not sources of information. Central actors were influential players with their experience, expertise and traits in controlling the transfer and flow of information and resources which are important for professional learning, instructional change and reform implementation. Supporting this, Lovelace (2019) also revealed that teachers sought advice from teacher leaders who were knowledgeable, willing to help, student-focused and also experienced. Berebitsky and Andrews-Larson (2017), Penuel et al (2009) found that teachers having greater expertise and experience were sought out for advice and more central in the network.

We also found that school principals as assigned leaders did not come out as emergent leaders in their schools although it was an advice network. It could be that teachers regarded their principals busy with school affairs and turned to vice-principals instead. Previous research confirms our finding. Berebitsky and Andrews-Larson (2017) found that teachers having greater expertise and experience were more central in the network than administrators and that administrators were among the groups least consulted in math advice networks. Karaman (2015) and Kahraman, Sözen and Meydan (2012) also revealed that the assigned leader and the emergent leader were different individuals concluding that the formal leader was not the emergent leader.

It was also revealed that the actors who emerged as leaders were predominant in terms of personality traits and competences. Personality traits included characteristics such as being honest, reliable, fatherly (caring), helpful, well-intentioned, tolerant, fair, social and responsible with a sense of duty. The competences dimension included communication, problem solving and practical thinking skills as well as experience which displayed itself in technical, legal and social knowledge about profession and school. Our findings are greatly in line with those of Pielstick (2000) who concluded that informal leaders were high in honesty, reliability, fairness, sharing and caring. Likewise, Stincelli and Baghurst (2014) listed confidence, ability, knowledge, willingness, setting example, and influence as individual competences of an emergent leader.

Looking at the sources of power, it was seen that the actors perceived as emergent leaders were dominant in referent (charisma) power due to their appreciated personality traits, and also in information and expert power thanks to their experience, knowledge and skills. The two assistant principals who were emergent leaders in their network had an advantage of position in that they were able to learn more about management issues. They joined this power of position with their personal powers and thus were perceived influential in the eyes of followers namely other school staff. Another source of power that emergent leaders exhibited was the connection power that shaped their dialogue with other actors. It can also be said that natural leaders were at the forefront in the social dimension, that is, they were caring others.

LIMITATIONS

This research was a case-study using social network analysis to investigate advice networks and leadership emergence in three schools in Van, Turkey. The findings may not be generalized as the geographical scope of the study is limited and the social settings of each school can vary. It should also be noted that advice networks and friendship networks can overlap and a participant could select their friends as source of advice and thus nominate them as a leader.

CONCLUSION

This research sought to examine the content and structure of advice networks and emergent leaders of three schools using social network analysis methods. It was seen that emergent leaders were located in the core of the network as they received more times than other actors. Emergent leaders had strategic positions in the network mainly as information hubs with an opportunity to control the flow of resources and information that could be critical for collegial learning and school effectiveness. Emergent leaders were seen to have dominant personal characteristics and competences to influence other teachers. As for sources of power, emergent leaders were high in referent, information, expertise and connection power.

Social network analysis is a valuable means of revealing relationship patterns, content of networks as well as primary and peripheral actors. Thus, network analysis may provide assistance in identifying the informal structure and emergent leaders in a school, so the formal and informal organization could be better aligned for teachers' professional learning, reform and school development programs.

This research focused on the content, structure and major information-seeking patterns of advice networks as well as personality traits, competences and power sources of influential actors (emergent leaders) as perceived by network actors. More research on various primary, secondary and high school networks could further confirm existing research and open up new data for scholars, educators and practitioners about collegial learning, professional development and integration of formal and informal organization.

Friendship ties are highly likely to affect advice-seeking and advice-receiving acts. This effect could help some actors receive more votes and gain a central position in an advice network rather than their competences and knowledge. So, the effect of friendship ties could be searched to see if there is such an effect, and to what extent.

Finally, school principals delegate some of their authority and official tasks to vice principals or deputy directors so that there is an effective management of offices and the school. Keeping this in mind, researchers could investigate why school principals did not emerge as informal leaders and why teachers preferred to go to vice (deputy) principals to get advice and information.

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