# The contribution of Social Network Analysis in conceptualizing school failure: A methodological reflection on an exploratory inquiry

## Il contributo della Social Network Analysis nella concettualizzazione del fallimento scolastico: una riflessione metodologica su una ricerca esplorativa

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This paper presents the rationale for adopting Social Network Analysis (SNA), as a methodology for inquiring into the complex system of causal factors that impacts on the scholastic achievements of at-risk students. SNA provides an analytical perspective that can be contextualized within a socio-cultural theoretical model, by considering development as a factor that is closely interconnected with the cultural, social and relational environment in which the student is immersed. The unit of concern in Social Network Analysis is the pattern of social relationships, constituted by connections, boundaries and gaps among educational communities. Through the use of SNA, it is possible to investigate the structure of social relationships that influence the learning paths of students at-risk of school failure, and the processes and underlying dynamics. In this contribution, the role of SNA is examined by reference to an ongoing research with students at risk of school failure in a professional school. We report an exploratory inquiry in which the SNA is applied to highlight the development of the social relationships in a class of students, during the course of a group activity in a vulnerable school context (developed inside the FAMI-IMPACT FVG 2018-2020 project). The SNA highlights the role that innovative activities can have in sustaining interdependence and reciprocity among students and support their motivation to learn.

Keywords: Social network analysis; At-risk students; Socio-cultural perspective; Mix methods; Interdependence.

Il lavoro introduce la Social Network Analysis (SNA) come metodologia per indagare il complesso sistema di fattori causali che influisce sul rendimento scolastico negli studenti a rischio. La SNA fornisce una prospettiva di analisi inquadrabile all'interno del modello teorico socio-culturale, intendendo lo sviluppo come un fattore strettamente interconnesso con l'ambiente culturale, sociale e relazionale in cui lo studente è immerso. L'unità rilevante nell'analisi delle reti sociali è il modello delle relazioni, costituito da connessioni, confini ma anche da fratture tra le comunità educative. Attraverso la SNA è possibile studiare la struttura delle relazioni sociali che influenzano i percorsi di apprendimento degli studenti a rischio di fallimento scolastico, nonché i processi e le dinamiche sottostanti. In questo contributo viene esaminato il ruolo della SNA facendo riferimento a una ricerca in corso con studenti a rischio di fallimento scolastico in una scuola professionale. Viene descritta un'indagine esplorativa in cui viene applicata la SNA per evidenziare lo sviluppo delle relazioni sociali in una classe di studenti, nel corso di un'attività di gruppo in un contesto scolastico vulnerabile (sviluppata nell'ambito del progetto FAMI-IMPACT FVG 2018-2020). La SNA mette in luce l'impatto che le attività innovative possono avere nel sostenere l'interdipendenza e la reciprocità tra gli studenti e sostenere la loro motivazione all'apprendimento.

Parole Chiave: Social network analysis; Studenti a rischio; Prospettiva socio-culturale; Metodi misti; Interdipendenza.

# The contribution of Social Network Analysis in conceptualizing school failure: A methodological reflection on an exploratory inquiry

## 1. Introduction

Social relationships have a significant impact on an individual's quality of life. They can improve personal well-being and represent an educational opportunity. However, they can also have negative impacts, such as creating obstacles and difficulties within a person's life context. Relationships influence people's social worlds, changing their personal experience and the way they feel, as well as having an impact on all the more concrete and experiential aspects linked to information and resources that people can access, as they come into contact with certain networks.

The relational structures in which people are embedded are complex, and exert a determinant influence on a school's social environment and on the dynamics created within it. The members of the network are considered interdependent and the modes in which their relationships are stabilized over time, constitute the social structure of that context (Wasserman & Faust, 1984).

The Social Network Analysis (SNA) represents a methodology to investigate the relational structures present in schools, highlighting the networks of interactions between individuals (students, teachers and staff) and subsystems (class, group of teachers, management, administration, etc.). An analysis of the networks provides information on the inclusiveness of the social environment, on the presence of social hierarchies or of subgroups, and on the links between one group and another, between inside and outside of the network.

SNA provides insight into the structure of social relations, as well as offers information on the quality of the relations presented in a given context. For example, it can explore how students, staff and teachers perceive and experience certain aspects of the social environment, how close they feel to each other at school, whether they feel their teachers show interest in them, whether they feel safe, a sense of belonging,

equity in the application of the rules, participation and respect (Hawe & Ghali, 2007). Moreover, it can capture information on the dynamics of social relationships, with the aim of understanding how interpersonal exchanges take place between people, or how quickly they pass and how easy it is to collect resources.

## 1.1 *Theoretical approach of SNA applied to the learning path study of at-risk students*

School disengagement is a widespread phenomenon (Batini & Bartolucci, 2016; Serpieri & Grimaldi, 2013; Tarozzi, 2015), characterized by the interaction of manifold variables, which creates unique configurations of opportunities and constraints, impacting on individual's learning pathways. Schools are not isolated from families, communities and informal groups, and individual students develop their own learning pathways by living in the local/unique web of these interacting systems (Lee, 2009).

SNA offers a theoretical perspective to conceptualize school disengagement in vulnerable communities of students at-risk of failure, as the phenomenon is characterized by multiform factors which interact to generate dynamic patterns of interaction, which each individual navigates to find his/her own personal pathway of learning and well-being. SNA departs from the positivistic model of linear chains of causal relationships. As a consequence, it contrasts with the Marxist approach of considering the achievement gap as the symbolic level of representation of economic inequalities (Bowles & Gintis, 1979), as well as the concept of "culture of poverty" and "cultural deprivation" (Lewis, 1966). SNA can translate theories into methodologically grounded perspectives, which consider the multidimensional causality of school failure.

According to Bernstein (1990), perceiving a single causal chain of recontextualization of social differences in school needs to be overcome. What is relevant in the educational process are the relationships that can be established among different social contexts (Bernstein; 1996). The «specialized form of communication realized by the pedagogic discourse of education in schools» (Bernstein, 1990. P. 165), is contextualized and affected by being part of a larger system of other specialized discourses, such as those enacted in the family or in other educational agencies. Whereas relationships between contexts are "strongly classified", the learner experiences isolation and fragile developmental pathways; on the other hand, whereas the learner may con-

nect personal meanings throughout different contexts ("weak classification"), each previous experience is a resource for the development of personal competencies. Another relevant dimension of educational encounters is the "framing" of educational interactions, that is the opportunities to express and negotiate meanings in educational interactions. Limits in the exchange of meanings impact on the participation of learners in the educational process.

According to Bronfenbrenner's theory (1995), a whole system of connected communities should be considered as the necessary environment for resilient developmental pathways. Individual development and learning are influenced by a network of factors, internal and external, that interact through dynamic interconnections (Bronfenbrenner & Morris, 2006; Magnusson & Stattin, 1998; Sameroff, 1983). Human growth is related to individual, social and ecological characteristics of the external world, that influence developmental trajectories throughout a person's life course. School failure is not determined by a single factor, rather it arises as a result of the interactions between individual and contextual influences, in which social relationships play a central role (Cairns, Cairns & Neckerman, 1989; Zarrett *et al.*, 2009). It is evident that students are immersed in a social context characterized by a network of relationships that can change over time, and tend towards more functional dynamics (Lerner, 1984). Effective networks have a positive impact on individuals and vulnerable communities, since they offer support to cope with stressful conditions and create access to cultural resources. By contrast, the achievement gap is the way in which risk has been institutionalized by the limited historical development of social networks and connections among social communities.

As Lee (2009) maintains, an effective practice to counteract school disengagement should take into account the mutual and dynamic relationships among people's participation in a variety of settings, within and across time. Therefore, in the integrated theoretical perspective advocated in this contribution, the focus of analysis are the ecological patterns needed to understand human learning and development. By «situating risk as an attribute of the challenges to which youth are exposed», (Lee, 2009, p. 74), SNA is a powerful methodology for reconstructing boundaries, gaps as well as positive connections and potential pathways for individual learning.

## 2. SNA as a methodology: analysis of relational structure and processes

SNA represents a useful methodology to investigate the structure of social relationships that influence the learning pathways of students at risk of failing at school, and that concurrently allows for investigating the processes and underlying dynamics. To better understand the complexity of the relational factors that influence a student's learning pathway, it is not enough to investigate the structure of the relationships, but also necessary to understand in depth the way in which this structure impacts on the student. The complexity of social relations presented inside the school system, makes it necessary to employ a stratified approach to data collection, mixing quantitative and qualitative methods (Thompson *et al.*, 2017).

### 2.1 *Quantitative analysis*

The quantitative analysis of networks describes in statistical terms the relationships present in a social context, and analyzes "relational" data through different methods of investigation. SNA focuses on the analysis of "links" (the "lines" representing relationships) between actors (the "nodes" representing the members of a community) in a social group.

The analysis reconstructs the relational structures present at school, by capturing the social positions occupied by the various actors (for example the node can identified students or teachers and the links the relationships between students, between teachers, or between students and teachers).

Quantitative analysis can also provide information on the presence of negative relational dynamics or isolation of some students, which are aspects that can determine a potential risk situation in their learning pathways; furthermore, it can identify who plays a key role, who occupies a leading or expert position, and who therefore can exercise a strong impact on the rest of the group within a given social network. The analysis of social networks gives information on the patterns of communication of information, resources, ideas or other aspects that are part of social exchanges.

The data are collected through surveys, in order to obtain information on the presence or absence of connections. The quantification of the relationship takes place through an "adjacency matrix", in which the links between actors are recorded as present or absent. The bonds can be reciprocal, that is when they are reciprocated and indicated by

the dyad, or direct when indicated by one of the actors, but not vice versa. Data can be processed through dedicated software (for example, UCINET (Borgatti *et al.*, 2002)), and obtained through statistical and descriptive indices, such as:

- Network density: represents the number of links or connections between people in the network; this index allows us to understand the level of cohesion within a group. If the density is low, this may have negative effects on students' learning pathways and therefore work is needed to increase the reciprocity of relationships.
- Degree of centrality of the network: the measure of the number of direct connections a person has with others, providing an indication of which members are more central in the network. It allows us to identify isolated individuals within the class group or to identify subgroups, and represents a useful measure to understand the relational influence in group dynamics.

## 2.2  *Qualitative analysis*

The qualitative analysis of SNA investigates the lived experience within a social network, or the consequences of the social dynamics inside the network; it can add details of the quality and strength of bonds, but also of their variation over time (see for example, Emmel & Clark, 2009; Heath *et al.*, 2009).

Qualitative approaches generate a range of narrative, observational and visual data on social networks. The content of these data is qualitatively analyzed and placed within a wider context.

Typical methods for qualitative network analysis are in-depth interviews and observation:

- In-depth interviews collect information on the individual's relationship, as the focal point of the network (Heath *et al.*, 2009). As consequence, they trace each respondent's privileged relationships within a community and obtain complementary information on the development of relations inside the networks. In the school context it could be applied to inquiry the students' social relationships, the quality of their bonds and their social experiences (Sarazin, 2017).
- Observations can be used to take note of the respondents' interactions and attitudes towards the other members of the group. In a school context they are used to analyze the participation in the stu-

dents' daily activity and the social dynamics (Martinez *et al.*, 2003). Observational data can be used to record the interactions between actors, which are eventually transformed into a graphical representation and into matrices, to perform statistical analysis (Edwards, 2010).

### 2.3 *SNA applied in the school system to investigate learning path of at-risk students*

The SNA can be applied in the school system at different levels of analysis and for different purposes, assuming a perspective of investigation in which people and their actions are seen as interdependent on each other (Wasserman & Faust, 1984).

In this contribution, three researches, in which SNA is used to identify the critical factors that influence the participation of at-risk students in school, are introduced: in the study by Thompson *et al.* (2017), SNA brings out the structure and quality of interactions among teachers and highlights its effect on the learning outcomes of students; Mahoney (2014) highlights the dynamic of change in the students relationships involved in supportive school activities; Sarazin (2017) explores the quality of interdependence in a group of vulnerable students and underlines how the implicit cultural background of a macrosystem affects the students relationships.

According to Thompson *et al.* (2017), the combination of Social Network Analysis and qualitative methods represents an original methodological approach to investigate strategies to support vulnerable students. In their research, Thompson *et al.* focused on the pattern of collaboration among teachers, as a crucial element that can impact on the learning success of at-risk students. Using a mixed methods approach, the authors analyzed different networks of collaboration between teachers in supporting students in situations of school vulnerability: Social Network Analysis was adopted to quantify the collaboration within the schools and to obtain a picture of the pattern of connections; in-depth interviews were used to examine the quantitative results in detail, exploring the perceptions of some of teachers regarding collaboration.

Data about the teachers' social networks were collected through a survey; a semi-structured interview was also adopted, to collect information on the teachers' perception about the effects of their professional collaboration as a support to vulnerable students.

Results found variations in the network of collaboration, which co-

herently reflected the organizational structures of the schools. Moreover, the SNA highlighted that denser and more reciprocal networks were associated with a positive sense of collaboration between teachers and with higher student outcomes. In this study, quantitative SNA and qualitative interviews were used in complementary way, to make evidence on the quality of interactions and its impact on students learning outcomes. In particular, SNA was a valid tool to visualize and evaluate the quality of teacher's collaboration in the school. The methodology adopted has allowed the researchers to capture the complexity of the social relationships presented in the school system, providing a deeper understanding of the ways in which the network structures are influenced by the institutional context of reference, and consequently impact on collaborative school climate. The results obtained can be used to work out formative projects, in order to enhance the quality of teachers' collaboration.

In the study conducted by Mahoney (2014), the author analyzed the protective role of peer networks in the risk of school dropout, using a longitudinal perspective; he focused on the dynamics of change of the risk in relation to the social relationships experienced by the students. The social networks were obtained through self-reports questionnaires on social relationships among students, collected longitudinally; through interview, qualitative information was collected on the development of relationships during extracurricular activities (data were collected at the end of primary school, during middle school and finally at high school). The research evidences that the participation of students in extracurricular activities lowers the risk of early school leaving over time. The study presented a holistic perspective of analysis of learning pathways, in which the interactive process introduced in the social networks, played a crucial role. The use of SNA has provided information about interrelations between individual and social contexts, helping to identify the relational factors that could reduce the school risk and social processes, and their adjustment over time. In this study, SNA is applied to highlight change in the students' social and relational processes, as well as to understand whether specific educational activities are associated with the reduction of early school leaving.

The quality of the interrelations created among a group in the school context is problematized in a research by Sarazin (2017), through a mixed-methods case study approach. Sarazin explored the quality of interdependence and the mechanisms of social experiences in a group of students, attending a school-based music program in primary school. The aim of the program was to improve social cohesion and social skills, increase self-esteem and academic outcome in at-risk

students coming from disadvantaged backgrounds or with a story of difficulties in their learning experience. The interdependency among participants in a community makes the individual both an influence on peers and in need of them. Within schools and classroom communities, networks of interaction influence students' social cohesion and foster exchange of learning strategies, reducing peer conflicts; this reciprocity creates the collaborative construction of ideas and problem solving attitudes (e.g., Osterman, 2000). The development of communities is a relevant component of personal well-being and personal agency (Brown & Campione, 1990). However, as observed by Sarazin (2017), it is important to problematize these assumptions: there may be cases of silencing voices of participants, introducing constraints to individual agency. Sarazin (2017) combined ethnographic methods with quantitative measures derived from structured interviews, through which social network findings were derived, by asking the students to nominate their friends among class group.

The results of the study highlighted that although the program was trying to build group cohesion, and used a strategy to create interdependence between students, these goals were not always achieved. The SNA revealed that in some groups, the level of friendship and of reciprocated friendship was low.

These results were explained by information collected through narrative interviews: the students experienced the interdependence negatively, perceived as an imposition, constraint, or as a lack of trust from adult. The students felt that their personal and group agency was shaped by the constraints imposed on them by the adults, and therefore they seized an opportunity to develop the group identity framed as oppositional to this. They did not feel that the teachers attributed them with the competencies nor provided them with necessary resources to develop their own learning; they believed the adults only considered them as students in need of more opportunities for learning.

These results underline that innovative educational programs should not limit themselves to the creation of groups of horizontal reciprocity, governed by top-down relationships. Rather, they also need to create networks of reciprocal relationships and a mutual exchange of objectives and competencies vertically, between students and teachers. This in turn induces apparently oppositional groups to share responsibility within the whole community. In this study, SNA was applied to shed light on the impact of educational interventions on the quality of the bonding among a group of students; as a result, it was highlighted that, in some cases, they affect students' relationships and cohesion in an opposite direction than expected.

## 3. An example of application of SNA in a vulnerable school context

Given the relevance of social networks in students' learning outcomes, SNA can be adopted to map the students' social networks before and after a school educational project, to analyze the impact of the intended educational innovation in promoting cohesion between students (Haythornthwaite & De Laat, 2010).

In the following research, the author relies on the corpus of existent data to introduce school activities to promote interdependence among students, as a protective factor toward learning failure (e.g., Osterman, 2000). It is assumed that the students who feel themselves as members of a community are more engaged in the school activities; in turn, this interdependence promotes a positive learning involvement. In fact, interdependence establishes a positive context of interaction, where students can learn from each other (Sarazin, 2017).

On the basis of these considerations, this section reports an exploratory inquiry (Lumbelli, 1989) of application of SNA, in order to highlight the development of the social relationships in a class of students, during the course of a group activity in a vulnerable school context[1].

The structure of the social networks in a group of students attending the second year of a professional school is investigated: we analyzed the network of their internal relationships before starting a class group activity and at the end of it. Students participate to a group activity (lasting 10 hours) with the aim to promote interactions and discussion between classmates, on the theme of the non-hostile way of communication. The activity was planned with the class teachers; the aim of the project was to promote e a more cohesive conversation, prosocial behavior and a deeper connection among students.

Through the Social Network Analysis we identify possible situations of risk or isolated students and we monitored the change in the relational structure among them. We use qualitative methodology (observation and a focus group with students) to better understand the data collected trough SNA.

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Therefore, we address the following research questions:

RQ1: Does the social network's structure inside the class change after the group activity?

RQ2: How the activity is perceived by the students? Do students perceive a change in their network?

### 3.1 *Sample*

The sample consisted of 22 students attending the second year of a professional school in the Friuli Venezia Giulia Region (22 females; age M=16,5; SD= 0.28). Students came from a variety of countries of origin: 3 students came from extra UE countries (foreign students); 16 had Italian citizenship (Italian students); and 2 had Italian citizenship with one of their parents coming from extra UE countries (Migration background); 1 student came from UE country. 9 students were repeating the year; 6 students present special educational needs.

Teachers provided information on the school context; the school presents a higher percentage of non-Italian speakers and students coming from culturally and economically disadvantaged areas. In the first and second grades, there is a higher rate of students who have just arrived in Italy and do not speak the Italian language.

### 3.2 *Measures*

General information and relational data are collected through a survey distributed to the students before starting the group activity and after its conclusion. The questions explored the following aspects:

1. General information: age, citizenship, sex; school delay;
2. Sociometric questions:
   (a) Network before group activity:
      A1 'With which of your classmates do you hang out with during break or talk about personal things?'
      A2 'Which of your classmates do you ask help for homework?'.
   (b) Network after group activity:
      B1 'After your participation to the activity, with which of your classmates would you like to hang out with during break or talk about personal things?'
      B2 'After your participation to the activity, to which of your classmates would you like to you ask help for homework?'.

To answer these socio-metric questions, respondents were provided with a list of their classmates. In order to contribute to ensuring anonymous analysis of the data, the list contained a letter code for each actor. Students were asked to indicate this letter code by completing the survey (there was no limitation to the number of classmates a respondent could indicated).

### 3.3 *Data analysis*

The analysis was conducted using the software package UCINET 6.0 (Borgatti *et al.*, 2002). The existence or absence of a relationship between two students is defined by a value of 1 (represents a relationship between them) or 0 (indicates the absence of any tie between the two members).

We provide basic information about the global structure of the network calculating network density and the degree centralization. We used graphical visualization to highlights relevant information in the network.
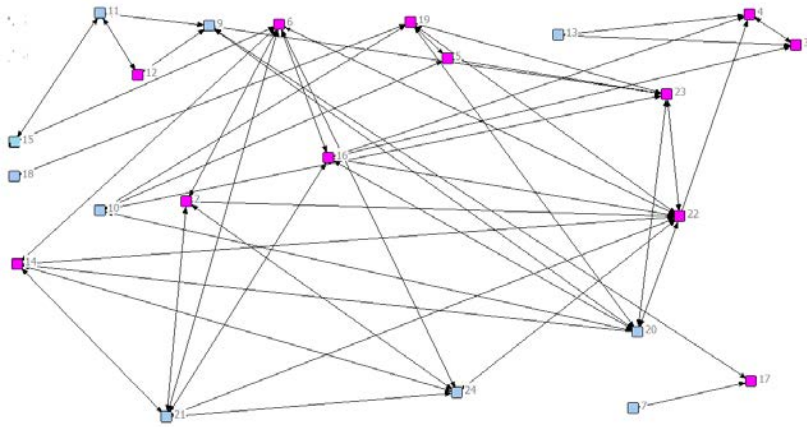
### 3.4 *Results*

Results show an increase of the density of the network after the conclusion of the activity: (pre) question A1 density= 0.062 (nr of ties= 34; sd= 0.240); (post) question B1 density= 0.138 (nr of ties= 76; sd= 0.345 ); (pre) question A2 density= 0.025 (nr of ties= 14; sd= 0.157); (post) question B2 density=0.065 (nr of ties=36; sd= 0.247).

The degree of centrality also increase; the number of students with central position has grown: (pre) question A1 centrality= 0.163 (nr of central nodes=2); (post) question B1 centrality=0.219 (nr of central nodes=5); (pre) question A2 centrality =0.155 (nr of central nodes=2); (post) question B2 centrality=0.204 (nr of central nodes=3).

The networks constituent before and at the end of activity are represented in Graph 1 and 2.
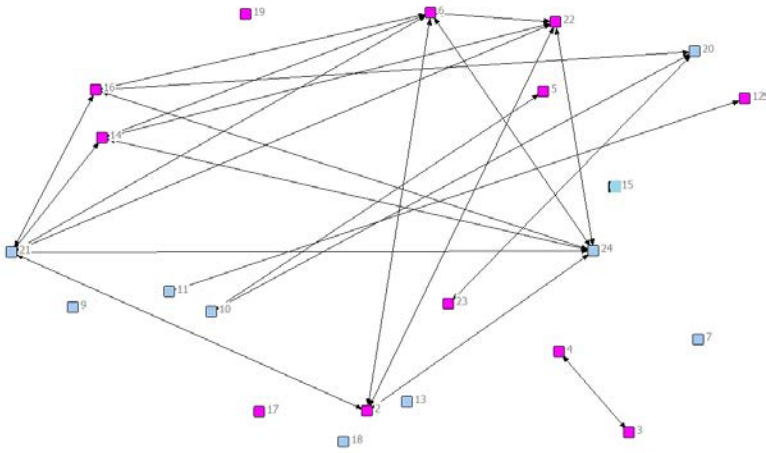
**Graph 1: Network before group activity: blue square = students in school delay; pink square= student not in school delay**



**Graph 2: Network after conclusion of group activity: blue square = students in school delay; pink square= student not in school delay**

### 3.5 *Discussion of results*

The network shows changes in the student relationships after conclusion of group activity. At the beginning of activity, some students were isolated (almost students in school delay), and the connections were low; after participating in the activity, students increased their connections and the students who at the beginning were isolated, have created new connections with classmates.

The number of students with a central position also increased, showing a more homogenous distribution in the student relational influence in group dynamics. Qualitative observation conducted during activity highlighted a general good involvement of the students and the tendency of helping the struggling classmates. Foreign students with Italian as additional language were supported by other girls, who provided help in translating concept or by using imagines. Students with educational special needs participated actively and expressed their idea using different channel of communication (for example by using graphical representation). Only a limited number of students demonstrated a low participation in the activity, showing reduced involvement. At the end of the activity, a focus group with students was conducted to understand their perception of the group cohesion and the impact of the activity in their relationships. The majority of students gave a positive feedback: they reported that they have learned to be more conscious of the importance of communication; furthermore, the students reported an increasing awareness of the relevance of understanding the points of view of the other students and to listen to the others. Some students perceived a positive change in their relationships, but they were not able to clearly specified in which aspects they were modified. They felt that something positive happened during participation of the activity, they felt a deeper knowledge of their classmates, but this remained only an uncertain perception. Few students found the activity useless and not interesting and reported that they didn't feel it necessary. The SNA data reveal a change in the network of the students, highlighting a general good impact of the group activity, supported by the observational data which show a positive collaboration among students. However, the focus group reveals that the students did not reach deep awareness of the dynamics of their relationships, suggesting the need of assigning additional time to the activity. The results highlight how SNA could be applied in a school context to detect a change over the time in the students' social network and obtain statistical index to measure its modification over time; the SNA methodology offers a strategy to understand the impact of specific school activities on relational dynamics of the students.

## 4. Conclusion

SNA is a useful method to understand school disengagement among minority and vulnerable communities of students, since it reconstructs the networks of communication among different educational systems

(Mahoney, 2014). Interpersonal relationships are influenced by the conditions that arise in the social environment. SNA identifies a set of actors and explores their relationships within a defined community; within a school, SNA studies affiliations, relationships and friendships. It integrates the educational theories that conceptualize schools as the pedagogical devices for the reproduction of social relationships (Bernstein, 1996; Lee, 2009), as well as the identification of situated opportunities for change towards social justice.

Social interconnections can be highlighted through different methods – quantitative and qualitative – given the dual objective of the SNA in investigating both the structure and the form of the networks, as well as its relevance in highlighting the interactional processes that create the networks. Qualitative studies can complement SNA by studying in depth the implications of the existing patterns of communication on school achievement, as experienced by the people involved (i.e., Sarazin, 2017). The participants' responses to interviews add important information on the context and are useful for interpreting maps and measurements taken from the quantitative survey. They also add insight on how networks work, and on the quality of the links and their evolution over time.

SNA can be applied in participatory action-research, since it identifies the critical elements that hinder the participation of pupils from vulnerable communities in schools, at different level of analysis: for example, the structure and the quality of interactions between members of a group (i.e., Thompson, 2017); or the dynamic process of change in relationships over the time (i.e., Mahoney; 2014); or the interaction between relationship and the macro system setting (i.e., Sarazin, 2017).

The individuation of these critical variables can support the design of educational projects and their evaluation over time; for example, SNA can be useful to identify the members in a group who can have an impact on the success of an intervention, i.e., the "key players" or "gatekeepers" who occupy an "expert" position in a given social context and have the task of filtering information in that specific area (Hawe, & Ghali, 2007). Otherwise it can be applied to map the social networks before an educational intervention, in order to calibrate the project, and reapplied at the end of the path in order to evaluate the efficacy (Mahoney, 2014). Thus, SNA is a promising approach that could provide a contribution to the design of a pedagogical framework that can more effectively support the learning pathways of vulnerable students, in diverse school contexts.

# References

Batini, F., & Bartolucci, M. (2016). *Dispersione scolastica. Ascoltare i protagonisti per comprenderla e prevenirla*. Milano: Franco Angeli.

Bernstein, B. (1990). *Class, Codes and Control. The Structuring of Pedagogic Discourse.* London: Routledge.

Bernstein, B. (1996). *Pedagogy, identity and control.* Lanham: Rowman & Littlefield.

Borgatti, S.P., Everett, M.G. & Freeman, L.C. (2002). *Ucinet for Windows: Software for Social Network Analysis.* Harvard, MA: Analytic Technologies.

Bowles, S., & Gintis, H. (1979). *L'istruzione nel capitalismo maturo.* Bologna: Zanichelli.

Bronfenbrenner, U., & Morris, P. (2006). The bioecological model of human development. In W. Daman, R. Lerner, M., & Lerner, R. M. (Eds.), *Handbook of child psychology: Theoretical models of human development* (1, pp. 793-828). Hoboken, NJ: John Wiley & Sons.

Bronfenbrenner, U. (1995). The bioecological model from a life course perspective: Reflections of a participant observer. In P. Moen, G. H. Elder, Jr., & K. Lüscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 599-618). Washington, DC, US: American Psychological Association.

Brown, A. L. & Campione, J. C. (1990). Communities of learning and thinking, or a context by any other name. *Human Development*, 21: 108-125.

Cairns, R. B., Cairns, B. D., & Neckerman, H. J. (1989). Early school dropout: Determinants and configurations. *Child Development*, *60:* 1437-1452.

Edwards, G. (2010). *Mixed-method approaches to social network analysis*. National Centre for Research Methods.

Emmel, N., & Clark, A. (2009). *The methods used in connected lives: Investigating networks, neighbourhoods and communities.* Real Life Methods-ESRC National Centre for Research Methods.

Haythornthwaite, C., & De Laat, M. (2010). Social networks and learning networks: Using social network perspectives to understand social learning. In *Proceedings of the 7th international conference on networked learning* (pp. 183-190). Aalborg, Denmark.

Hawe, P., & Ghali, L. (2007). Use of social network analysis to map the social relationships of staff and teachers at school. *Health education research*, *23*(1): 62-69.

Heath, S., Fuller, A., & Johnston, B. (2009). Chasing shadows: defining network boundaries in qualitative social network analysis. *Qualitative Research*, *9*(5): 645-661.

Lee, C. D. (2009). Historical evolution of risk and equity: Interdisciplinary issues and critiques. *Review of research in education*, 33(1): 63-100.

Lerner, R. M. (1984). *On the nature of human plasticity*. New York: Cambridge University Press.

Lewis, O. (1966). The culture of poverty. *Scientific American,* 215(4): 19-25.

Lumbelli, L. (1989). Pedagogia sperimentale e ricerca esplorativa. *Scuola e città*, 3: 97-104.

Magnusson, D., & Stattin, H. (1998). Person-context interaction theories. In W. Damon, & R. M. Lerner (Eds.), *Handbook of child psychology: Theory,* 1: 685-760.

Mahoney, J. L. (2014). School extracurricular activity participation and early school dropout: A mixed-method study of the role of peer social networks. *Journal of Educational and Developmental Psychology*, *4*(1): 143-154

Martınez, A., Dimitriadis, Y., Rubia, B., Gómez, E., & De la Fuente, P. (2003). Combining qualitative evaluation and social network analysis for the study of classroom social interactions. *Computers & Education*, 41(4): 353-368.

Osterman, K.F. (2000). Students' need for belonging in the school community. *Review of Educational Research*, 70 (3): 323-67.

Sameroff, A. J. (1983). Developmental systems: Contexts and evolution. In P. H. Mussen, & W. Kessen (Eds.), *Handbook of child psychology: History, theory, and methods* (Vol. 1, 4th ed., pp. 237-294). New York: Wiley.

Sarazin, M. (2017). Can student interdependence be experienced negatively in collective music education programmes? A contextual approach. *London Review of Education*, 15: 488-504.

Serpieri, R., & Grimaldi, E. (2013). *Che razza di scuola*. Milano: Franco Angeli.

Tarozzi, M. (2015). *Dall'intercultura alla giustizia sociale. Per un progetto pedagogico e politico di cittadinanza globale*. Milano: Franco Angeli.

Thompson, I., Daniels, H., Ortega, L., & Tawell, A. (2017). *A social network analysis of school advice-seeking patterns to support vulnerable learners: A critical methodological account*, Book of Abstracts**,** ISCAR 5th International Congress August 28 -1 September 2017 Quebec, Canada.

Wasserman, S., & Faust, K. (1984). *Social Network Analysis: Methods and Applications*. New York: Cambridge University Press.

Zarrett, N., Fay, K., Li, Y., Carrano, J., Phelps, E., & Lerner, R. M. (2009). More than child's play: variable-and pattern-centered approaches for examining effects of sports participation on youth development. *Developmental psychology*, 45(2): 368-382.