Is Mixed Methods Social Network Analysis Ethical?

Book Section

Is Mixed Methods Social Network Analysis Ethical?

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Abstract:

This book chapter aims to explore the affordances and limitations of Mixed Methods Social Network Analysis (MMSNA) from an ethics perspective. In line with Ifenthaler and Schumacher (2016) we define ethics as "a system of fundamental principles and universal values of right conduct". There may be substantial ethical considerations when conducting MMSNA research in comparison to more 'standard' social science approaches: lack of anonymization; potential to identify non-respondents; and identification of "hidden" sub-groups. We will use one practical example to highlight potential ethical issues when conducting MMSNA research. We hope that by raising awareness of the potential ethical issues, researchers, practitioners, and the actual participants will become more mindful of the affordances and limitations of MMSNA research approaches.

INTRODUCTION

A wide variety of researchers have adopted social network analysis (SNA) methods in the last two decades and have found that the way people build social network relations has important implications for areas such as business (Borgatti & Molina, 2003; Conway, 2014), education (Baker-Doyle, 2015; Cela, Sicilia, & Sánchez, 2015; Rienties, Héliot, & Jindal-Snape, 2013), health (Hommes et al., 2014; Jippes et al., 2013), well-being (Ellison, Steinfield, & Lampe, 2007; Neri & Ville, 2008), and work

relations (Borgatti & Cross, 2003). Furthermore, several researchers have started to triangulate quantitative SNA with rich qualitative data collection approaches (e.g., Baker-Doyle, 2015; Froehlich, 2019; Rienties & Hosein, 2015; Rienties & Kinchin, 2014), which provides opportunities for in-depth and fine-grained analyses of individuals' experiences within existing social structures. Yet despite this growing body of SNA research that has found that relations matter in nearly all facets of life, there are remaining issues related to the potential ethical and privacy issues that go along with studying such relations using SNA (Breiger, 2005), and Mixed Methods Social Network Analysis (MMSNA) in particular (Froehlich, 2019).

In this book chapter, we define ethics as "a system of fundamental principles and universal values of right conduct" (Ifenthaler & Schumacher, 2016), and as a way of evaluating actions by making judgements about what we and others do (White, 2017). Privacy is often considered an ethical issue since, as Smith, Dinev, and Xu (2011) argue, privacy beliefs form part of a society's moral value system. We define privacy as "the claim of individuals to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin, 1967).

As highlighted by several studies (Borgatti & Molina, 2003; Conway, 2014; Hoser & Nitschke, 2010) and a special issue on ethics in the journal *Social Networks* (Breiger, 2005), there may be substantial ethical considerations when conducting SNA and MMSNA research in comparison to more 'standard' social science approaches. First, in social science methods such as surveys or interviews, participants can *choose* whether or not to take part in the studies (Kember & Ginns, 2012; Torgerson & Torgerson, 2008). With increased scrutiny by Institutional Review Boards (IRBs), researchers are also expected to appropriately provide potential participants with information about the purpose(s) of their research the reasons why they have been asked

to participate, and an informed consent form with detailed information about the benefits and potential risks of participating (Borgatti & Molina, 2005; Borgatti & Molina, 2003; Hoser & Nitschke, 2010). With this in mind, data would not be collected about non-respondents and they would typically be excluded from follow-up data analyses and results.

In contrast, in SNA it is often still possible to generate a social network profile of a non-respondent based upon the perceived relations provided by others in the network (Conway, 2014; Kadushin, 2005), irrespective of whether a conscious (e.g., refusal to participate, fear of being marginalised) or unconscious decision (e.g., incomplete submission, forgot to indicate the respondent's name, forgot to participate in online survey) was made not to participate. For example, even though Margaret has chosen not to participate in an SNA survey, if her friends Barbara, John, and Jin indicate that she is a friend of theirs, Margaret can still be connected with three peers within SNA data. In this way, SNA researchers have access to quantitative and possible qualitative data about non-respondents, and can make potential inferences about the relations and social lives of those who opt not to participate.

Second, participants who agree to participate in a piece of research in most social science approaches are able to do so in an anonymous and confidential format (Borgatti & Molina, 2003; Conway, 2014; Kadushin, 2005). Yet this is not the case in SNA, as described by Borgatti and Molina (2003, p. 338): 'the most obvious difference is that in a network study, anonymity at the data collection stage is not possible … [as] the researcher must know who the respondent was to record a link from that respondent to the persons with whom the respondent indicates having relationships.' Yet, confidentiality of respondents' identities are considered to be an essential part of ethics and privacy in social science research and SNA research in particular (Kadushin, 2005).

Therefore, strong procedures and policies are needed in SNA studies to ensure that, during the data processing phase, the researcher acts as an independent gatekeeper between respondents and potential end-users of social network data (i.e., peers within the social network, managers making promotion and firing decisions, teachers addressing potential drop-out issues, other researchers).

Third, a common practice in social science research to safeguard privacy and agency of a respondent is the premise that at any point within a specified period of time participants can withdraw their consent to participate in research and have a right to be forgotten (Goolsby, 2005; Hoser & Nitschke, 2010). However, as highlighted by both Borgatti and Molina (2003) and Conway (2014), "removing" these participants from follow-up data analysis might have fundamental implications in terms of the reported formation of ties and network structure, in particular when these participants are central nodes in a social network, or are potential bridge-builders (Rienties, Johan, & Jindal-Snape, 2015) between different clusters. For example, if Margaret is the only person who is connected to both Barbara and John's local host-national group of UK students, but at the same time is connected to an international group of students via Jin, removing Jin's link to Margaret (who has not participated in this research) might imply that there are no links between local and international students, which might have severe implications for positioning the outcomes of this research.

Fourth, there could be strong ethical and pedagogical concerns when it becomes clear that certain groups of students are potentially systematically excluded from (i.e. do not participate in) particular learning and social activities, based upon their age and "seniority" (Rehm, Gijselaers, & Segers, 2014; Rienties & Hosein, 2015), gender (Bevelander & Page, 2011; Palonen & Hakkarainen, 2000), cultural identity (Mittelmeier, Rienties, Tempelaar, & Whitelock, 2018; Quinton, 2018; Rienties et al.,

2013; Rienties et al., 2015), and/or specialisation (Rienties & Héliot, 2018; Rienties & Hosein, 2015; Rienties & Kinchin, 2014). For example, previous research has found that Chinese learners like Jin seemed less likely to be actively involved in a small group learning in a UK business school, and were also less likely to respond to SNA surveys (Rienties & Héliot, 2018).

Systematically removing participants like Lin from data analyses could not only lead to misrepresentations of MMSNA data, but also fundamentally underplay any cross-cultural group interactions and potential racial tensions, Some of these processes may be a result of common social network phenomena, like homophily (i.e., a tendency to build links with people with similar perceived traits), preferential attachment (i.e., a preference to link to other, well-connected peers), or unconscious bias. However, mapping these relations might provide uncomfortable insights, which then create ethical dilemmas related to acting upon received knowledge.

While there is an emerging body of literature addressing the ethics of SNA (Hoser & Nitschke, 2010; Kadushin, 2005), limited guidelines are present for researchers who are using mixed methods approaches by combining quantitative and qualitative data collection tools (Baker-Doyle, 2015; Rienties & Hosein, 2015; Rienties et al., 2015). In a review of SNA studies in management literature, Conway (2014, p. 108) argued that "quantitative approaches may be viewed as being relatively effective at revealing the structure of networks, whilst in-depth data available through qualitative approaches may be seen as more effective in providing insight into the process, content, and context of relationships and interactions." Therefore, as the use of MMSNA rises, there are clear needs to engage with ethical implications of the research approach.

As such, we aim in this chapter to examine whether MMSNA research is ethical in the first place and, if so, which key principles of privacy and ethics are necessary

considerations for those who adopt such methods. In particular to education contexts, where researchers, practitioners, and teachers are increasingly using SNA and MMSNA to visualise the invisible patterns in and outside the classroom (Cela et al., 2015; Hommes et al., 2014; Rienties et al., 2013), there may be inherent challenges when providing educational interventions to improve the learning experiences for students. Therefore, we will use one practical example to highlight potential ethical issues when conducting MMSNA research. While we are not aiming to develop a simple 5-step approach to address ethical issues in MMSNA, we hope that by raising awareness of the potential issues that researchers, practitioners, and the actual participants become more mindful of the affordances and limitations of MMSNA research approaches.

ETHICS, PRIVACY, AND MMSNA

Research ethics has its foundations in medical research ethics (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978; World Medical Association, 2013), with codes and guidelines developed to communicate ethical research practices. The main issues highlighted in this code include the need for participants' voluntary and informed consent, the need to minimise harm or injury to participants, that there are benefits to the research and that these should be greater than the risks, and finally, that participants have a right to withdraw from the research without any consequences.

The Helsinki declaration includes the recommendation that research protocols should be reviewed by an independent committee before the research is carried out. The Belmont report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978) was developed in response to the Tuskegee syphilis study where African American males unknowingly took part in a study on the

progression of syphilis. Those who had the disease were left untreated even after treatment was identified. Therefore, the Belmont report contained three basic principles (Mandal, Acharya, & Parija, 2011):

1. Respect for persons.
2. Beneficence which means minimizing harm and maximizing benefits to participants.
3. Justice where the risks and benefits of the research must be fairly distributed.

Numerous codes and guidelines have been proposed since the Nuremberg code. Present-day codes and guidelines have built on or extended these early principles, highlighting their relevance and importance in the conduct of ethical research. In ethics debates, a distinction is often made between those who might benefit from or be harmed by the respective research. According to Kadushin (2005, p. 151), often a medical science argument is put forward to do research that might harm an individual but may benefit humanity as a whole, whereby "[e]ven though the individual subject may not benefit from the research, lives may eventually be saved". However, in SNA research, according to Kadushin (2005), often the beneficiaries of the research are the researchers themselves or the managers in organisations, but typically not the individual respondents. Therefore, Borgatti and Molina (2003, p. 348) argued that "all studies should provide some kind of feedback directly to respondents as payment in kind for their participation".

Ethics and MMSNA in Education

Since the early origins of social network approaches, researchers have been aware of the potentially intrusive data that could be collected using SNA (Borgatti & Molina, 2003; Conway, 2014). From a pragmatic SNA perspective, as indicated by Borgatti and Molina (2003, p. 339) "[n]etwork studies also differ from conventional

studies in that missing data are exceptionally troublesome. Consequently, network researchers have a vested interest in not letting organizational members opt out of a study. This may lead them, consciously or unconsciously, to fail to point out the real ramifications of participating in the survey." This may particularly be an issue when participants are not familiar with SNA methods, which is often the case (Borgatti & Molina, 2003; Conway, 2014), and, as a result, cannot completely evaluate the potential benefits and limitations of contributing to the research.

In reviewing the potential ramifications of SNA in terms of ethics, Borgatti and Molina (2003) distinguished between academic research (i.e., SNA research for research's sake) and consulting practice (i.e., SNA research to share data with organisations who asked for SNA insights). Borgatti and Molina (2003) argued that, in particular, consulting management practice could lead to difficult ethical issues (e.g., using SNA to inform senior leaders about who are not well-connected in a unit, who might afterwards be fired because of a lack of "connectedness"). In this chapter, we argue that there might be a middle space between academic and consulting practice, namely the teaching practice.

There could be sound pedagogical arguments why MMSNA might be useful in teaching practice, and perhaps educational interventions may be urgently needed to help each learner reach his or her potential. For example, SNA could be used to identify and support excellent students (Hommes et al., 2014) or help others to connect to these students (Rienties et al., 2015), to identify potential bridge builders who can provide connections between disconnected groups (Rienties & Hosein, 2015; Rienties et al., 2015), and/or identify at-risk students who might need additional support (Rienties, Tempelaar, Van den Bossche, Gijselaers, & Segers, 2009).

If a participant declines to participate (for whatever reason) in an SNA study, there is still an option that data about this 'non-participant' could still be gathered by other means (Borgatti & Molina, 2003; Conway, 2014). In other words, if peers contribute to a SNA study, the respective social relations with the non-participant can still be identified, or inferred (Neal, 2008; Rienties & Kinchin, 2014). One perspective on this non-response is provided by Borgatti and Molina (2003, p. 339), who argued that "what respondents are normally reporting on is their perception of their relationship with another, which is clearly something respondents have a right to do: every respondent owns their own perceptions". Therefore, Borgatti and Molina (2003) argued that not obtaining explicit consent from non-respondents is not an issue.

Whether one agrees with this statement or not can be debated, in particular when collecting rich, triangulated MMSNA data. Questions MMSNA researchers and practitioners should take into consideration are:

- Are you going to report about the non-respondents?
- Are you going to use non-respondents' data in any way?
- In this case while the participants do own their own perceptions, is it ethical to make any statements/inferences about non-respondents?

In a way, by combining the strength of quantitative SNA with richer, finer-grained qualitative approaches, these ethical concerns may be even further exacerbated. Given that many SNA studies over-emphasise the quantity of relations in a network over the quality of network relations and typically under-emphasise the flow through a network, Conway (2014, p. 113) "recommended that researchers adopt a mixed method approach, incorporating both quantitative and qualitative data collection methods". In particular when SNA data are linked with rich qualitative data, such as diaries (Hommes et al., 2014), log-files (Cela et al., 2015; Rienties et al., 2009), or interviews (Rienties

& Hosein, 2015; Rienties et al., 2015; Rienties & Kinchin, 2014), there may be more opportunities to develop a deep understanding of the complex processes in networks.

Of course, the other side of the coin is that, with the increased triangulation of data, there may be an increased risk of ethical and privacy concerns. One obvious potential risk that is that participants who refused to participate in a study can not only be identified by researchers and peers in terms of their name, but also additional attributes (e.g., gender, cultural background) and characteristics (e.g., motivation, beliefs) could be linked (Palonen, 2019; Sarazin, 2019). For example, in follow-up interviews Jin might indicate that she primarily developed strong relations with Margaret because they are members of the same cycling group. Barbara might indicate that they meet every day at 1600 at the Library to discuss and compare notes of lectures and seminars. John might indicate that he is primarily friends with Margaret because they both share a common experience with drug-abuse in their working class families, which continues to have a negative impact on their identity and self-esteem.

While there are arguments to be made that it would be methodologically useful to know more about particular non-participants, this triangulation of data may go against the principles and ethics of human research (e.g., the relationship has nothing to do with education) or might have limited pedagogical value (e.g., unless Jin and Margaret discuss their studies during their bike rides, one wonders what the value is of knowing the origins and frequency of their relationship).

Although researchers and practitioners might have the best intentions when conducting MMSNA and aim to 'thoroughly' understand their learners, relatively quickly one could get into some awkward situations. For example, as also indicated in Chapter 21 (Rienties, 2019), when trying to understand why some students became cross-cultural bridge builders over time in a third year undergraduate business module,

sampling five initial potential bridge builders using betweenness and centrality measures with follow-up in-depth interviews led to truly in-depth narratives of what, how, and for whom students learned in an international classroom environment (Rienties et al., 2015). At the same time, these in-depth narratives were at times exceptionally confrontational for some participants, see Eyah in Chapter 2 (Rienties, 2019).

In addition, even with substantial anonymization it would be relatively straightforward for participants in the respective module to identify themselves in the SNA graphs and identify the five bridge builders due to the rich, triangulated data (Rienties et al., 2015). In part, these rich data and narratives are needed to understand the complex dynamics of how students develop friendships and learning relations over time in a complex intercultural classroom, but at the same time these rich narratives might compromise anonymity and confidentiality, at least for the participants in this respective module (Hoser & Nitschke, 2010). In the remainder of this chapter we will describe the lessons learned from one MMSNA study that we conducted in the last five years.

A PRACTICAL EXAMPLE OF ETHICAL CHALLENGES WHEN CONDUCTING MMSNA

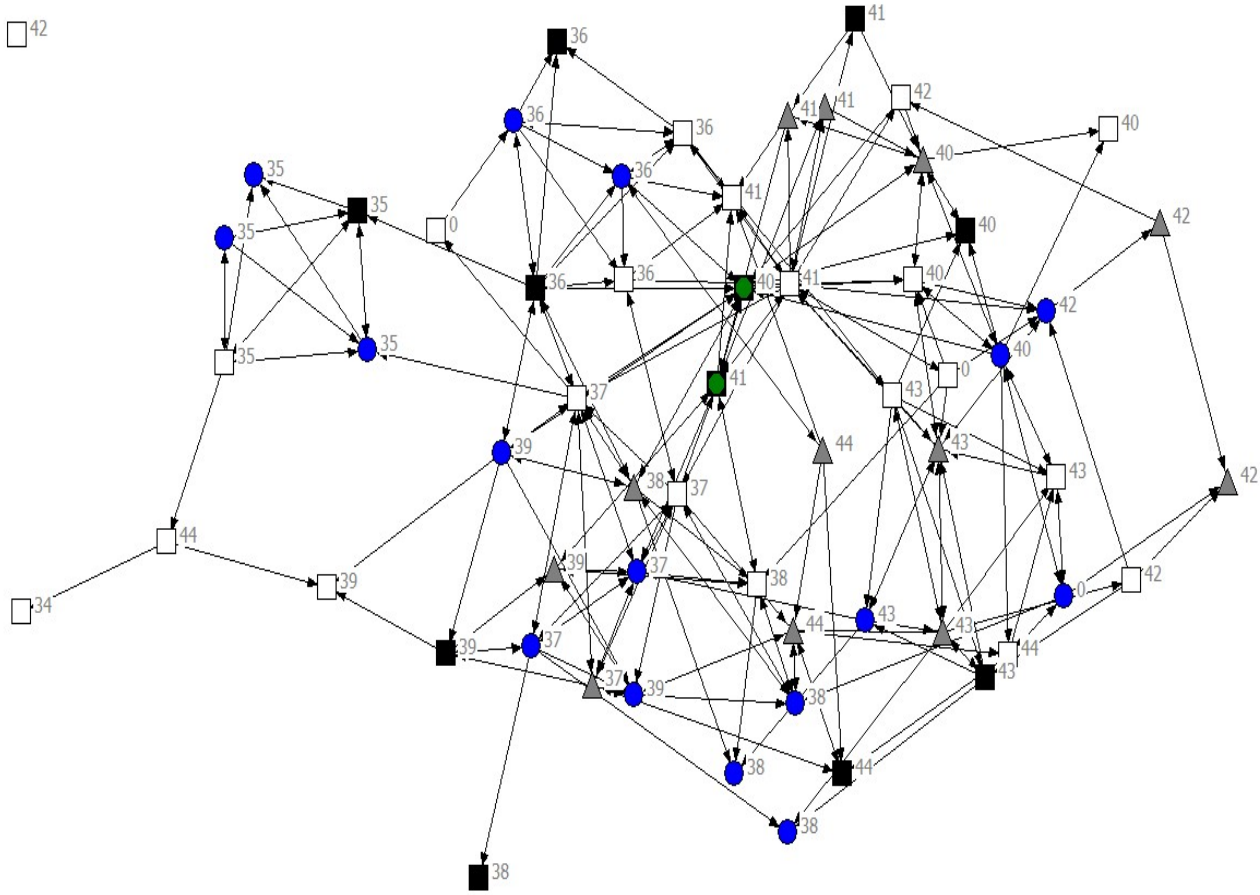
From the outset it is important to note that the practical example of MMSNA (Rienties & Hosein, 2015) that we have chosen for this chapter is not in any way a "best-practice". In fact, by being open and honest about the lessons that we learned in the last five years while collecting the various stages of the data, we hope to resonate with the readers that doing research in MMSNA is by definition complex, non-linear, and potentially ethically challenging. In order to minimise potential risks for those who might not have

been aware of the potential implications of participating in SNA research (Borgatti & Molina, 2005), this example was particularly chosen in a postgraduate setting, whereby participants were professionals, early-career academics, and familiar with the ethical benefits and risks of doing research.

We aimed to occupy the middle space between academic research and management practice of Borgatti and Molina (2003), whereby we primarily were interested in making the invisible networks of learning visible to participants and organisers of the learning and teaching programme respectively. At the same time, we were keen to give participants the opportunity to better understand how peers in their programme were connected, with whom it might be useful to talk, and who might need to be included a bit more to provide a cohesive learning experience for all. For a detailed description of the setting, procedures, and data analyses, we refer to previous published work (Rienties & Hosein, 2015) and Exemplar 3 in Chapter 21 (Rienties, 2019).

As reported in Rienties and Hosein (2015), researchers and practitioners could use SNA visualisations to identify how cohesive the learning climates within groups are. For example, all members of group 35 on the top left of Figure X.1 are closely connected to each other, while perhaps group 38 might warrant some further investigations why some members were not connected to their group. Researchers and practitioners could use these SNA visualisations to identify whether particular participants or groups are isolated, or even "at risk", such as the participant in group 42 on the left of Figure X.1 who is not connected to anyone in the AD.

Figure X.1 Learning & teaching network after nine months (colour and shape refers to disciplinary background, number refers to group number in which participants learned)



Source: Rienties and Hosein (2015, p. 170)

The triangulated qualitative findings indicated that three broad thematic areas arose: professional, emotional and academic support. The data suggested that there was a strong indication that participants needed to find an outlet to share their feelings, in particular their challenges, anxieties and frustrations about their teaching, and their experiences on the AD programme in particular (emotional support). Participants used their university colleagues for academic support, which refers to support with studying the AD programme, and professional support, which refers to support with the participants' teaching practice.

Lessons learned

First of all, the lead author who collected the SNA and qualitative data was also part of the teaching team with three other academics delivering the AD. Whether or not specific learners within his taught groups might have reacted differently in comparison to when a neutral third-party researcher would have conducted the research is impossible to determine. In hind-sight, it would have been better to give the SNA data to a third person for data analysis and processing, and to only receive the anonymised data.

Second, even though for teaching and learning improvements no ethics approval is needed from IRB in this respective university, one could wonder about whether it is right that teachers themselves conduct research on their own "students" (Kember & Ginns, 2012; Torgerson & Torgerson, 2008). Although the primary motive of this "action-research" was to better understand how effective the PG CERT programme was to develop internal and external learning relations for participants to share their teaching and learning practice, in hind-sight participants might not have felt comfortable sharing their informal network relations with one of their teachers, or being "confronted" with visualisations of their PG CERT network when working with peers in the qualitative exercise.

Third, some participants were well connected with others, while others were more on the fringes of the network. In particular, one engineer from group 42 was not connected to anyone after nine months of study. Follow-up individual conversations with this participant indicated that the engineer did not learn from peers, and found that the programme was just a compulsory "tick in the box exercise" in order to pass probation. At the same time, the fact that 52 peers independently indicated that they did not learn from this engineer is pedagogically interesting, while at the same time

potentially personally damaging. In hind-sight one wonders whether it was appropriate to approach this participant to talk about this situation.

On the one hand, one could argue that if the engineer and the peers in the PG CERT indicated that there were no mutual learning relations, as a teacher one has a moral obligation to enquire what the underlying reasons might be. As a wealth of SNA research has found positive effects of learning relations on learning and academic performance (Hommes et al., 2014; Neri & Ville, 2008; Rienties & Héliot, 2018), teachers could reasonably be expected to act upon meaningful data to provide alternative strategies that could help the engineer to become more connected. On the other hand, one could argue that it might be wrong to "single out" one person, or perhaps even unethical. Perhaps learning individually might be a very appropriate learning strategy for this engineer, and the absence/lack of learning relations does not automatically imply that the engineer was not learning. Indeed the engineer passed the PG CERT six months after this data was collected.

DISCUSSIONS

As highlighted in this chapter, conducting Social Network Analysis research could lead to potential ethical and privacy issues (Borgatti & Molina, 2005; Breiger, 2005; Hoser & Nitschke, 2010; Kadushin, 2005), in particular when data are triangulated with other quantitative and qualitative data. Although there are clear ethics guidelines developed within medical science (Torgerson & Torgerson, 2008; World Medical Association, 2013) and in research with human participants in general (Mandal et al., 2011), the unique nature of collecting data in SNA could lead to potentially awkward ethical and practical concerns for researchers, teachers, and participants.

One pertinent MMSNA ethical issue focuses on how researchers should handle non-participants' data which is provided by participants, and whether or not they should include non-participants' data in the network. As non-participants' have not provided their consent for the study, it may be unethical to use their data, although there seems to be some disagreement in the SNA literature (Borgatti & Molina, 2003; Hoser & Nitschke, 2010; Neal, 2008) and the wider ethics literature (Westin, 1967; World Medical Association, 2013). As seen in the discussion on ethical codes and guidelines (Mandal et al., 2011; Shuster, 1997; Torgerson & Torgerson, 2008), obtaining a participant's voluntary and informed consent is a key principle for ethical research. Additionally, if researchers proceed to include non-participants' data due to its relevance to the network, there may be a risk that non-participants will perceive that their privacy has been violated. This fails to meet the principle of minimizing harm to participants, as MMSNA researchers might be able to identify "at-risk" groups or individuals even though they did not consent to participate in this research. In particular, in the educational context which we focus on in this work, it might be easy to identify the non-participants in the network.

MMSNA researchers have three options to deal with non-response. First, they can seek non-participants' consent to use their data. Non-participants might assess that the benefits, for example to their learning, are greater than any harms they might experience. In such a case, non-participants may later provide their consent for their data to be used, or even opt to participate in the study.

Should non-participants continue to withhold their consent, then MMSNA researchers will need to carefully think about and balance two opposing options. The second option could be to include these non-respondents, as indicated by Borgatti and Molina (2005), as the perspectives of other members of the network could be regarded

as valuable resources for understanding the complex dynamics in that network. Especially if multiple people, independently from each other, confirm the (non)existence of a social network relation, there could be some strong SNA arguments why it could be valid to include these observations. Of course this second option would require MMSNA researchers to be extremely cautious in reporting results beyond the overall network structure, and inferences of non-respondents. A third option could also be relevant in certain cases, whereby researchers may have to exclude non-participants' data from further consideration. By definition, this will change the various metrics of the whole network structure (e.g., centrality, density) as well as ego-analyses.

SNA and MMSNA researchers can also work to identify and address potential barriers to participation in their research. For example, it may be that non-participants feel that they have not been informed to their satisfaction about the research and any consequences arising from their participation. This highlights the importance of transparency during the recruitment phase. Researchers should provide full information about the research to potential participants, and also make potential (non-)participants aware that they may be identifiable based upon the contributions of their peers, even if they do not actively participate in the research. At the same time this may require researchers to carefully reflect on the potential need to rebalance the notions of informed consent. Potential participants might feel "forced" to contribute to provide their side of the narrative if they are aware that their network relations can be inferred from their peers irrespective whether they participate or not. Alternatively, it might "push" potential respondents away from participating as they may not want to put their peers in an unwanted network position. In this way, participants' decision to participate or not participate are fully informed and additionally, barriers and thus potential issues with their research can be made clear to SNA and MMSNA researchers.

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