Working Paper

Collecting Network Panel Data in Schools

Practical Guidance Based on the Experiences of Three German Research Projects

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Abstract

There is an increasing amount of literature on how to analyze longitudinal data of complete social networks. Guidance on how to collect such data in schools, however, is both scant and desperately needed, because longitudinal social network analysis has high data requirements. Aiming to provide guidance for future data collection of school-based networks, we share our experiences gained in three different projects collecting longitudinal social network data in different samples of German schools. This includes both one large-scale study that relied on a nationally representative sample of schools and two smaller studies that targeted more specific geographical areas. We discuss key decisions researchers have to make before data collection, the definition of school samples, and the selection of schools. We further offer advice on how to improve school participation and students' response, describe the fieldwork, and make recommendations for projects aiming to collect longitudinal social network data.

Contents

1 Introduction

In the past two decades, longitudinal research on social networks has seen considerable growth.[1] This increase was stimulated by both methodological and computational advances that enable the use of estimating complex statistical models in order to account for the interdependencies between network partners.

Longitudinal social network data, i.e., *network panel data*, allow researchers to examine the evolution of social networks over time while simultaneously investigating related changes in actors' behavior and attitudes. The most prominent statistical method for this purpose are so-called stochastic actor-oriented models (SAOM). SAOM offer the possibility to disentangle the process of network evolution from network influences on individual behavior and attitudes (Snijders et al. 2010; Steglich et al. 2010; Veenstra et al. 2013).[2] Using network panel data and SAOM, recent studies have provided important insights into various subfields, including but not limited to criminology (Weerman 2011), economic sociology (Lazega et al. 2012), interethnic relations (Leszczensky & Pink 2015; Stark & Flache 2012), and sociology of education (Flashman 2012).

While longitudinal social network analysis is by no means limited to certain contexts, for two reasons the vast majority of respective research has been conducted on the basis of data collected in *schools*: First, school arguably constitutes one of the most important contexts during adolescence. For example, adolescents make most of their friends at school, and schoolmates are in turn relevant in explaining various types of individual behavior (Veenstra et al. 2013). Second, schools allow for a relatively clear specification of network boundaries, as they provide students with comparatively stable and distinct social contexts.

Yet, the data collection process of school-based networks remains a *black box*. While there exist several introductions to statistical models for longitudinal social network analysis (Snijders et al. 2010; vanderWeele & An 2013), there is a lack of practical guidance for researchers who intend to *collect network panel data* in schools. This absence is unfortunate, since longitudinal social network analysis poses high demands on data quality, especially with respect to missing data (Huisman & Steglich 2008). Even more than in the realm of conventional surveys, collecting high-quality data is thus crucial.

Drawing on our experience gained in three research projects that collected network panel data in secondary schools of different populations in Germany, we provide guidance to key decisions and strategies suitable to improve data quality.[3] The first project, *Children of Immigrants Longitudinal Survey in Four European Countries* (CILS4EU; Kalter et al. 2014, 2015) collected two waves of classroom-level network data in a representative sample of 144 schools all over Germany, using a paper and pencil questionnaire (PAPI).[4] Data collection in Germany was carried out by the field institute IEA Data Processing and Research Center. The second project, *Friendship and Violence in Adolescence* (FVA; Beier et al. 2014; Kroneberg et al. 2016), collected three (of a total of four) waves of grade-level network data in secondary schools in five cities within the same German region, using audio-enhanced, computer-assisted self-interviewing (ACASI; Beier & Schulz 2015). A total of 39 schools participated in waves 1–2 and 47 schools

1 In this working paper, we focus on complete social networks, such as the ones within school classes, organizations, or firms.

2 There are alternatives to SAOM for analyzing longitudinal network data (see vanderWeele & An 2013). We evaluate the data collection process in the light of its potential using SAOM, however, because the data requirements for SAOM represent a rather strict criterion.

3 While we focus on school-based networks, many of our considerations also apply to other settings such as clubs, firms, or organizations.

4 We restrict ourselves to data collection in Germany, as legal aspects differ between countries, for example, with respect to parental consent for students' participation. Note that the latter is a very important aspect in shaping response rate differentials between students of different countries. While active parental consent is usually required in Germany, for instance, passive parental consent is sufficient in the Netherlands.

participated in wave 3.[5] *Friendship and Identity in School* (FIS; Leszczensky et al. 2014, 2015) constitutes the third project, which collected four (of a total of six) waves of grade-level networks in nine secondary schools across one federal state of Germany, using PAPI. Table 1 provides an overview of the three projects' key features.

While the three studies have many similarities (e.g., the age range of the sample), they also differ in important aspects, each having specific strengths and weaknesses. By combining the extensive experience obtained in these three projects and providing it to the research community, we seek to improve future data collection.

Table 1: Overview of the three projects

	CILS4EU (Germany)	**FVA**	**FIS**
Mode	PAPI	ACASI	PAPI
Waves collected/planned	2/2	3/4	4/6
Time between waves (in months)	8–12	12	9
Network boundary	Class	Grade	Grade
Number of schools (wave 1)	144	39	9
Number of networks (wave 1)	269	39	26
Number of participants (wave 1)	5,013	2,635	1,668
Age of participants (wave 1)	ca. 14	ca. 13	ca. 11–13

This working paper proceeds as follows: First, we discuss key decisions researchers have to make before data collection, such as deciding on what kind of relationships to observe, defining network boundaries, and determining the temporal spacing of survey waves. Second, we discuss the process of defining a school sample and selecting schools. Third, we offer advice on how to improve both school participation and students' response rates. Fourth, we describe the actual fieldwork, including school visits and ways to deal with typical problems that arise in the field. We conclude by summing up the most important practical advice.

2 Decisions Preceding Data Collection

2.1 Types of Relationships: What and How to Observe?

The first step for network researchers is deciding on the kind of social relationships to assess and how to adequately measure these relationships by using survey items. Depending on specific research interests, information on both positive social relationships, such as friendships, and negative ones, such as victimization, can be collected, as well as various other types of relationship, such as spatial (e.g., walking distances to classmates' homes) or romantic ones (e.g., dating).

One fundamental issue is whether or not to allow *unlimited nomination* of network partners. If given the opportunity, some students nominate many more network partners than usual and therefore require more

5 For budgetary reasons, higher secondary schools, i.e., German "Gymnasiums", were only included starting wave 3, which accounts for the increase of participating schools (Kroneberg et al. 2016).

time to answer the network part of the questionnaire. This is problematic in a school context where the time allotted to the survey is restricted by school lessons and cannot be extended for students taking particularly long. Based on extensive pretesting, FIS and FVA therefore only allowed a limited number of nominations for each network dimension, which was justified given that most students nominated within a common range. This range differed between network dimensions, with more nominations (between 5 and 10) for positive ties, such as friendships, and fewer nominations (between 3 and 5) for negative ties, such as bullying.

Moreover, certain questions specifically aim at a small subset of peers so that an upper nomination limit makes sense from a substantive point of view. CILS4EU therefore opted for a combination of questions with unlimited (e.g., classmates living close to one's home) and limited nominations (e.g., one's five best friends). Leaving nominations to some questions unrestricted proved unproblematic, as students nominated within the rather limited boundaries of their classroom only. Since results of limited and unlimited nomination procedures might differ for certain research questions (Gommans & Cillessen 2015), though, researchers should carefully weigh their options and pretest possible limitations on nominations.

Regarding the actual measurement of different types of relationships, all three surveys proceeded similarly. Depending on how network boundaries were defined (see below), each student received a list with the names of all students of the same class or grade in alphabetical order, separated visually by classrooms, with each name corresponding to a number. Students were asked to use the numbers on the lists in order to answer a set of questions describing the surveyed network dimensions. Since the lists were not linked to the questionnaire data for confidentiality reasons, students were also requested to give their own number in the questionnaire, which served as an ID to link the questionnaires when constructing the actual networks.

This approach worked well in all studies and can be recommended for other studies. Only a handful of students in FIS and CILS4EU wrote down names instead of numbers. FVA used laptops for the data collection, which allowed banning non-numerical answers in the network module.

The obvious importance of ensuring an adequate measurement of the network is further amplified by the fact that errors at this stage might make whole networks and, therefore, large portions of the targeted data useless (e.g., if the assignment of students to numbers is mixed up). Network researchers should thus pay particular attention to this part of the data collection.

2.2 Defining Network Boundaries

The second step for studies that focus on complete social networks is to define *the boundaries of the network* in the form of a clearly defined group of actors (cf. Laumann et al. 1989). The school context is very suitable in this regard, given that clear-cut boundaries of school networks can be traced according to students' school membership/affiliation. At the same time, schools are arguably the most important context outside of the family that children and adolescents are embedded in. Most friendships of children and adolescents are formed in school, and school friends have proven to be influential for various attitudinal and behavioral outcomes (Veenstra et al. 2013). It thus seems warranted that many studies collect social network data in schools (e.g., Bicer et al. 2014; Stark & Flache 2012). Accordingly, all students within a given school context are considered to be part of the network and, therefore, of the sample. The precise composition of the network may change over time, as students who entered school after data collection had already started (e.g., because they had moved) are also part of the sample (Huisman & Snijders 2003).

However, schools are no monolithic blocks, with students being clustered into classrooms, grades, courses, or tracks. Most studies focus either on the classroom level, such as CILS4EU (see also Bicer et al. 2014; Stark & Flache 2012), or on the grade level, such as FIS and FVA (see also Goodreau et al. 2009; Moody 2001). This raises the question of how to define network boundaries *within* school, which, on the one hand, partly depends on the research questions that are intended to be answered. Different types of social relationships cross classroom borders to varying degrees, with some of them being mainly restricted to classrooms (e.g., violent offender–victim ties) and others exhibiting sizable shares of ties between different classrooms (e.g., liking and disliking). On the other hand, registering social networks for all classes of a grade offers three general advantages (Leszczensky & Pink 2015; Valente et al. 2013). First, the resulting networks are larger, thus providing a more comprehensive view of students' social relationships. Second, the processes generating within-classroom ties might differ from processes generating cross-classroom ties, possibly resulting in misleading conclusions if the latter are disregarded. For example, ethnic segregation might be more pronounced at grade level than at classroom level (Leszczensky & Pink 2015). Third, since combining all the classes of one year includes a larger number of actors and ties between them, these networks provide more statistical power for estimation. In our experience, this is crucial when estimating more complex models (i.e., when including many covariates and/or interaction effects).

An important methodological requirement limiting the size of the networks, however, is that SAOM assume all students to have at least a fleeting acquaintance with each other so that they could potentially nominate each other (Snijders et al. 2010). While this assumption is plausible in classroom-level networks or smaller grades, it becomes debatable in large schools with five or more classes per grade, where students of different classes might not be acquainted with all other students in their grade.

2.3 Timing is Key: When and How Often to Observe?

Once researchers have defined the social relationships they want to measure and the network boundaries they want to draw, they have to make two key scheduling decisions: when to start observing the defined networks and in what temporal intervals to follow up with subsequent waves of data collection.

For both technical and substantial reasons, researchers should consider starting the data collection *immediately after school transition*. In short, this both maximizes the duration of actors staying within the defined network boundary and acknowledges that many new social relationships are formed in the early stages of network formation.

Technically, meaningful longitudinal network analysis requires *stable network boundaries*, i.e., that the majority of students remain together in the same organizational setting for the entire period of observation. It therefore poses a problem when networks split up or are redistributed (e.g., if classrooms are sampled and divided into a course system in later school years).[6] The main reason for collecting data shortly after the initial network state is that many social relationships are formed relatively early in the network formation process. These initial relationships affect further tie formation, for example, through mechanisms of transitive closure or reciprocity (Goodreau et al. 2009). Of course, this general advice has to be judged against specific research interests. For instance, there are different stages of ethnic identity development which—depending on what exactly a researcher is interested in—may require studying different age groups. Drinking or smoking, by contrast, typically starts in early adolescence (Kiuru et al. 2010), thus calling for a survey of this particular period. One way of dealing with this trade-off is a multi-cohort design,

6 For example, due to tracking into different fields of specialization, all participants in the Dutch sample of CILS4EU were subject to classroom reallocations between waves 1 and 2, which made it impossible to keep the network boundaries stable over time (Kruse et al. 2015: 9).

in which different year cohorts are questioned within the same school, as pursued by FIS (Leszczensky et al. 2015).

Setting the *intervals between waves* also involves a trade-off. On the one hand, the intervals should be small enough to register substantial changes to social networks and behavior or attitudes of interest. On the other hand, the intervals have to be large enough to capture a significant degree of change providing sufficient variation to be exploited in the statistical analysis (cf. Snijders et al. 2010: 49f.). Intervals ranging from six months to a year are commonly chosen in studies of children or adolescents and are also appropriate, since social networks change to a sufficient extent during such a period (Chan & Poulin 2007). In our experience, both nine-month (Leszczensky et al. 2015) and one-year intervals (Beier et al. 2014; CILS4EU 2015) provide suitable data. In practice, intervals between waves are affected considerably by rather tight school schedules. Most obviously, data collection can neither take place during school holidays, nor during project weeks, class trips, or in periods of class tests. Moreover, many schools may not be willing to allow data collection within intervals of a few months or weeks.

3 Selecting Schools

3.1 Defining a School Sample

Having decided on a schedule, the next step involves defining a sample of schools. Two broad strategies are available: drawing a (stratified) random sample of schools, like in CILS4EU, or using a convenience sample of schools that satisfy criteria arising from the research goals, like in FIS and FVA. From the perspective of statistical inference, random samples would clearly be ideal. However, a more convenient approach may be useful for collecting network panel data as it opens up possibilities to select schools according to characteristics that may increase the network-analytical potential of the data (e.g., the number of students) and to increase efficiency (e.g. by maintaining particular close contact to these schools). Regardless of the choice researchers make, both strategies require school lists and statistics provided by federal states or local authorities and statistical offices.

CILS4EU was planned and conducted as a large-scale representative survey of the integration of immigrant adolescents, in which the collection of network data constituted a small but nevertheless important portion of the complete project. All schools in Germany entailing a ninth grade in the academic year 2010/11 were thus part of the German school sampling frame.[7] The sampling procedure relied on a stratified multi-stage sampling design (CILS4EU 2014). In the first stage, schools were selected from a stratified sampling frame with a probability proportional to their sizes, oversampling schools with high immigrant shares. Within each sampled school, two ninth-grade classrooms were chosen at random, and all students of the sampled classrooms were subjected to the student survey sample.

In FIS, schools in the German federal state of North Rhine-Westphalia with high shares of foreign students were sampled (Leszczensky et al. 2015). Following substantive considerations, lower-level secondary schools, intermediate secondary schools, and comprehensive schools were randomly chosen within specific strata that were predefined regarding different numbers of non-native students. The selection of schools was further restricted to grade sizes between 45 and 120 students.

7 Schools in the federal state of Bavaria had to be excluded, as the Bavarian ministry of education refused to participate in the study.

FVA sampled all eligible schools in a confined geographical area, comprising five cities in the Ruhr region (Beier et al. 2014). Focusing on a confined geographical space was necessary given the computer-assisted data collection using ACASI (see Beier & Schulz 2015) and also allowed for building local support with authorities. Substantive considerations regarding sample composition as well as practical reasons guided the decision for a particular sample area.

3.2 Legal Considerations Prior to School Contact

Depending on the surveyed country, there may be legal obligations to fulfill prior to any school sampling or attempt to get in contact with the schools. In the case of Germany, in nearly all federal states researchers are required to obtain approval from the respective state ministry of education in order to collect data in schools. While the actual procedure differs between federal states, this generally means that concepts of data collection as well as the questionnaire itself may have to be presented to each ministry for official approval. As this often takes several months, researchers need to anticipate this in their project schedule. In addition, data security engineers may prohibit specific questions, for example, about violent behavior, drug use, or third parties such as parents and non-participating schoolmates. Restrictions of the latter type are especially problematic when collecting school network data given that they may affect the decision of whether or not absent schoolmates appear on nomination lists. While FIS and FVA did not were not faced this problem, in CILS4EU, in some schools absent schoolmates had to be omitted from the nomination lists prior to their distribution to the students (see Kruse & Jacob 2014).

4 Ensuring Schools' and Students' Participation

4.1 How to Improve Initial School Participation?

Once schools are sampled and, if required, ministerial permission for conducting the survey is obtained, the next step is to ensure school participation. While access to schools may not automatically imply cooperation on the side of school authorities, teachers, or students (Wanat 2008), it is a prerequisite for any successful school-based survey.

In FIS, the school participation rate was rather low with around 10%, probably due to the fact that the sampling of schools was restricted to the federal state of North Rhine-Westphalia, where schools receive a great number of survey inquiries due to less restrictive state policies. In FVA, in contrast, 87% of all sampled schools participated in the study. This high response rate is probably in part a result of the sampling strategy that included only schools in a narrow geographical area. On the one hand, no university was based in this sample region, therefore reducing the "competition" of other studies. On the other hand, focusing on a rather restricted area allowed for localized efforts to increase school participation, for example by gathering the support of local authorities and by presenting the study and intermediary results to interested school headmasters and teachers in person. The school participation rate of CILS4EU ranged in between these two extremes, with 53% of the initially sampled schools taking part in the survey.

In our experience, the process of deciding whether or not to participate in a study differs considerably between schools. In some schools, principals make the decision single-handedly, while in other schools they consult with co-principals, social workers, teachers, or the parents' association. First providing schools with basic written information about the project and announcing that the principal would receive a telephone call within one or two weeks has proven a viable strategy to obtain school participation. Usually,

several calls were needed, and in both FIS and FVA some schools that initially refused to participate could eventually be convinced to participate through personal calls from the project leader.

Due to their tight schedules, many schools only participate in one study per year. We therefore recommend contacting the schools as early as possible. One of the most common reasons for not participating given by schools in all three projects was that they were already participating in another study (including rather small ones, e.g., for students' theses). FIS had particular difficulties to obtain school participation in university towns, as these schools often cooperated with local universities for data collection. Owing to its less restrictive policy regarding ministerial approval, this may also be a pronounced problem in the state of North Rhine-Westphalia.

Incentives seem to represent one obvious strategy to improve school participation. Assessing how strongly schools respond to financial incentives is difficult, though. In both FIS and FVA, some schools appeared to have based their support at least partly on *financial* incentives, with many schools being in favor of paying a fixed amount of cash into the class fund rather than paying it directly to participating students. In many other schools, by contrast, incentives were probably irrelevant for school participation; sometimes they were even perceived negatively, with principals or teachers in all three projects occasionally arguing that students should not be paid for filling out a questionnaire. *Non-financial* incentives involving information about the survey appeared to be more crucial for schools; in fact, many schools made written reports mandatory for participation. However, the schools' interest in information also varied considerably, with some schools being very eager to be informed and others never asking for information at all, or, when receiving it, not paying attention to it.

4.2 The Importance of High Student Response Rates

A crucial task for longitudinal network analysis is securing a high student response rate, since statistical models for social network analysis require high participation rates (Huisman & Steglich 2008). Networks with a considerable amount of missing data may not reliably represent the social structure of the network.

In all three projects and in all waves, students' overall participation rates exceeded 75% (Beier et al. 2014; CILS4EU 2014, 2015; Kroneberg et al. 2016; Leszczensky et al. 2015). In CILS4EU, participation rates remained constant throughout both waves, at 81% (CILS4EU 2014: 26).[8] In FIS and FVA, participation rates went up over time, from 77% and 79% in wave 1 to 83% and 81% in wave 2, respectively. In FIS, this increase was probably mainly due to the fact that the necessary parental approval (see below) had already been obtained for the students participating in the first wave and, therefore, students who had forgotten to return it the first time were given a second chance to bring in the approval and take part. In both FIS and FVA, students may also have become accustomed to the survey as well as to the incentive (see below), which may have encouraged other students.

In all three studies, panel dropout rates were extremely low: 91% of the students who participated in the first wave of FIS also took part in the second wave survey. In FAV and CILS4EU, the dropout rates were somewhat higher, but still rather small, with 83% of the students who participated in the first wave also participating in the second (CILS4EU 2015: 7).

8 Ten German schools refused participation in wave 2, and 26 low-track schools did not enroll a tenth grade. Students of these 36 schools were thus interviewed via telephone, post, or web surveys in wave 2, which did not include network-related items (CILS4EU 2015).

In all three studies, 5% to 10% of the students did not participate, because they were absent from school on the day of data collection due to sickness or other reasons. The remaining non-participating students either did not receive parental approval or forgot to return the form. Students themselves rarely refused to participate.

4.3 Obtaining Parental Approval

Obtaining parental approval is needed for surveying students in German schools, at least up to a certain age, and is thus an important factor for ensuring a high response rate. This requires two steps, both of which might be influenced by researchers. First, students have to obtain parental approval. As we discuss below, researchers may encourage this process by individual incentives, which increase the students' willingness to participate and, therefore, to collect their parents' permission. Second, students have to return the obtained parental approval to school. Aside from incentives, this may be encouraged by close contact with the teachers, who may remind students to hand in the parental approval. In our experience, this is even more important, as vastly different response rates between classes of the same school are to be due to individual decisions of the students. If possible, researchers should consider collecting parental approval not only for the first wave, but also for all future waves. This not only decreases the workload in further waves but also the likelihood that students forget to return their parental approval form (Leszczensky et al. 2015).

4.4 How to Incentivize Students?

While most students are physically present in school during data collection anyway, they still have to be willing to participate in the survey. One obvious strategy to encourage students is offering financial compensation (Laurie & Lynn 2009). In CILS4EU, participating students received €10 in each wave; FIS and FVA paid €5 in each wave. In FIS and FVA, schools could further decide on whether the participating students received the money themselves or whether the money was paid into the class fund. In FIS, most schools initially opted for individual incentives, while some schools changed their mind in later waves. In FVA, the vast majority of schools opted for collective incentives.

In FIS, where students in most schools received the money themselves, the provision of incentives probably increased students' willingness to participate. For instance, students explicitly asked about the five Euros in the schoolyard before the survey, when the study was being introduced, and again after the survey. Teachers also frequently reported that the parental approval forms were returned much sooner than any other school forms requiring parental consent. In FVA, by contrast, where the money was paid into the class fund, no similar observations were made. However, teachers sometimes mentioned the incentives to be important for funding class activities and, as a result, might have reminded students to return the permission forms. Given the very similar response rates, the relevance of these different types of incentives remains unclear.

5 Fieldwork

5.1 Organization

Depending on the size and geographical outreach of a survey as well as on available funds, fieldwork may either be conducted by researchers themselves or by a third -party survey agency. Given the high number and geographical dispersion of schools in the sample, CILS4EU opted for the latter. Facing smaller and geographically more concentrated samples, FIS and FVA organized and conducted the fieldwork themselves. In the following, we will therefore concentrate on the experience gained during fieldwork of these two studies.[9] We believe that supervising the survey sessions in school helps researchers to avoid potential problems, thus increasing data quality.

In both studies, information packages were sent to the schools at least three weeks before the survey date. Principals received letters describing the procedure of the survey on the appointed day and were given guidance as well as templates for the student lists needed for registering the networks. Class teachers were provided with a letter describing the key aspects in order to help them present the study to the class. In addition, they were asked to remind the students of returning the parental approval form in time.

About one or two weeks before the agreed date, the schools were once again contacted by phone. This served to ensure the preparation of the lists of students in each year, the collection of parental approval, and other details in preparation for the survey. These calls proved very useful and allowed to identify problems in advance and to come up with solutions. For example, in both FIS and FVA, when calling, school contact persons referred that the information package had not yet been opened, but that they would now take care of it. In our experience, we strongly recommend such telephone calls shortly before the visit to minimize the likelihood of unwelcome surprises on the day of the survey.

5.2 In the Field

In both FIS and FAV, schools were visited by a research team that usually included at least one project researcher, along with several interviewers. In FIS, up to five classes were supervised in parallel by one project team member; in FAV, data was simultaneously collected in up to two classrooms by two team members per classroom, using laptops for each student. In both studies, a double lesson was made available for the survey.

The interviewers introduced themselves to the classes and briefly explained the study. After the interviewers had handed out the questionnaire (in FIS) or prepared the laptops (FAV), the students were briefed on the questionnaire and in particular on the use of the name lists for the network questions by means of a standardized interviewer introduction. After this collective introduction, the students began to complete the questionnaire individually. The interviewers were available throughout the sessions to answer any further questions.

The presence of one researcher in the interviewer teams proved useful when dealing with individual teachers who opposed study participation or when practical problems arose, such as missing printouts of the class lists, which should have been prepared by the schools beforehand. If feasible, we therefore

9 One point to consider with regard to survey agencies conducting the fieldwork is that network data collection is still rather uncommon, and even professional survey agencies can only draw from limited experiences in this field. Particular care should therefore be taken in communicating the goals and specificities of network collection to the agencies.

recommend researchers to take part in the fieldwork; otherwise, researchers should at least train interviewers intensively and be available via phone at all times to handle unexpected problems.

6 Summary

While researchers intending to collect network panel data in schools can rely on the vast experience described in the literature on panel data in general, they are faced with some specific considerations discussed in this working paper. We conclude by summarizing what we believe to be the most important issues for researchers to address when planning longitudinal network data collections in schools.

First, researchers have to define network boundaries. In most situations, opting for grade-level networks rather than classroom-level networks is the more promising approach. Second, provided this does not conflict with the specific topic under study, data collection should commence after educational transitions, for example, at the beginning of secondary school. Third, from an inferential point of view, random school samples are generally preferable to more convenient locally restricted samples. Without the support of an external fieldwork institute, however, practical reasons may often speak in favor of the latter. In particular, intense cooperation and contact with participating schools is crucial. Fourth, students' participation should be maximized by additional efforts to obtain parental approval. Obtaining parents' permission for future waves at the same time can increase participation and decrease the workload in further waves. Finally, whenever possible, researchers themselves should supervise the survey session in schools to minimize mistakes and to increase data quality.

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