Part I

General Issues

1

Mixed Methods Social Networks Research: An Introduction

Betina Hollstein

Over the past 20 years there has been increasing recognition that focusing on *either* quantitative *or* qualitative research techniques alone leads researchers to miss important parts of a story. Researchers have found that better results are often achieved through combined approaches. In line with this observation, an increase in so-called mixed methods studies and research designs as well as in work providing overviews and systematic accounts of such research has been witnessed in various disciplines and fields of study since the early 1990s (Morse 1991; Creswell 2003 (first ed. 1994); Greene and Caracelli 1997b; Tashakkori and Teddlie 2003; Axinn and Pearce 2006; Bryman 2006; Creswell and Plano Clark 2007; Bergman and Bryman 2008; Teddlie and Tashakkori 2008). Of course, the combination of different methodical approaches is anything but a recent phenomenon in field research – one might think of the Marienthal study (Jahoda, Zeisel, and Lazarsfeld 1933), the Hawthorne studies (Roethlisberger and Dickson 1939), as well as of several studies by the Chicago School. In many areas of research, the combined application of different methods goes back a long time without being explicitly referred to as a mixed methods design.[1] However, the increased interest in and the systematic review of mixed methods designs and the results they yield are indeed new aspects in this development.

This interest in mixed methods designs can probably be explained in that their bringing together the strengths of both quantitative and qualitative strategies holds the promise of compensating for the respective weaknesses of both approaches. In view of the usually small sample

[1] Articles discussing the combination and integration of methods have been published in such journals as *Field Methods* and *International Journal of Social Research Methodology* right from the outset.

I am grateful to Johannes Huinink and the two anonymous reviewers for their helpful comments.

sizes, so-called qualitative (or interpretive, less standardized) research faces criticism for an allegedly arbitrary selection of samples and a lack of representativity, which in turn is said to raise questions as to the generalizability of results and to cause difficulties in the systematic comparison of cases and testing of causal models. Skepticism toward so-called quantitative (or quantifying, standardized) research, on the other hand, is mainly voiced with respect to its apparent neglect of the particular social context in which actors attribute meaning to their actions and to its potentially lower sensitivity to new, unexplored, or marginal social phenomena and developments. Mixed methods designs attempt at engaging quantitative and qualitative research strategies in an intelligent dialogue that benefits both sides. In their definition of mixed methods, Johnson and Onwuegbuzie aptly describe the aim and motivation underlying the mixed method approach: "Mixed methods research is the type of research in which a researcher or team of researchers *combines* elements of qualitative and quantitative approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) *for the purpose of breadth and depth of understanding and corroboration*" (Johnson and Onwuegbuzie 2007:123; emphasis added by BH).

Upon close inspection, a wide range of different approaches fall within this definition. Johnson and Onwuegbuzie asked 21 researchers for their definition of mixed methods and received 19 different responses. It seems safe to say that their definition represents the smallest common denominator of a variety of different definitions used to describe mixed methods. The various definitions offered by Johnson and Onwuegbuzie's respondents, which give a quite accurate picture of the definitions also found in the literature, can be distinguished as to what precisely is combined (methods, methodologies, or types of research), at what stages of the research process methods are combined (formulation of the research question, data collection, data analysis, data interpretation or inference), and to what end methods are combined (e.g., to achieve breadth or for corroboration or triangulation). In any case, when we speak of *combining* approaches, we are referring to more than a simple process of mere *addition*. As Creswell et al. put it, "A mixed methods study involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the *integration* of the data at one or more stages in the process" (Creswell 2003:212; emphasis added by BH). Instead of simple addition, the task is to systematically relate quantitative and qualitative strategies or data at at least one stage of the research process. Due to this systematic integration of qualitative and quantitative strategies, mixed methods designs create special

opportunities for improving data quality, thereby increasing the significance of results (Greene, Caracelli, and Graham 1989; Tashakkori and Teddlie 2003; Axinn and Pearce 2006; Bryman 2006).

In the discussion to come, we speak of mixed methods studies when at least three conditions are met: (1) First, the studies make use of qualitative as well as quantitative *data*. This does not necessarily mean that both qualitative and quantitative data must actually be collected. Making use of the two types of data may also take the form of data conversion; for instance, qualitative data are collected and converted into quantitative data for analysis. (2) Second, both qualitative and quantitative *strategies of data analysis* are applied. (3) And, finally, at at least one stage of the research process, there must be some form of *integration* of either data, or of data analysis or of results (meta-inference).

In reviewing network research, we notice that there has been no systematic consideration of mixed methods studies so far, neither with regard to possible research designs nor their potential for the study of social networks. If we look at the relevant manuals and handbooks in the field, it is quite obvious that the methodical repertoire of current social network analysis for the most part consists of sophisticated, highly standardized, and formalized methods of analysis (cf. Wasserman and Faust 1994; Degenne and Forsé 1999; Scott 2000; Carrington et al. 2005; Scott and Carrington 2011).[2] Although there is a significant number of network studies that combine qualitative and quantitative methods of data collection and analysis (e.g., Wellman et al. 1988; Provan and Milward 1995; McLean 1998; Diani and McAdam 2003; Smith 2005; Small 2009), we still lack a compendium that provides a systematic account of the field. The present volume contributes to this end as it is the first systematic overview on the use of mixed methods for investigating social networks.

We will present different ways of mixing qualitative and quantitative strategies and discuss the challenges and benefits for research on social networks. The chapters assembled in this book illustrate that the application of such designs can improve the quality of data and enhance the explanatory power and generalizability of results. Moreover, with respect to social network research, mixed methods studies promise to provide empirically sound contributions to current

[2] The application of qualitative research methods in network studies is mentioned only with respect to the collection of relational data (such as interviews, observations, or archival records; Wasserman and Faust 2005). Mixed methods designs for data collection are not described in detail, and qualitative methods and mixed methods designs for analyzing network data are not considered. For the first English language review on qualitative network research, cf. Hollstein (2011).

issues, especially concerning the processes, dynamics, and consequences of social networks.

We will take a closer look at these issues later on. Before we do so, we will first give a brief overview of the objects, questions, and approaches of network research. We must also clarify what the terms "quantitative," "qualitative," and "mixed methods" actually mean in the context of social networks.

The Concept of Social Network

According to J. Clyde Mitchell's classic definition, networks can be described as a "specific set of linkages between a defined set of social actors" (Mitchell 1969:2), whereby both the linkages and the social actors can refer to quite different social entities. Actors can be organizations, political actors, households, families, or individuals. The linkages or relationships may, for instance, refer to interactions or relations defined by a specific content, such as power relations, information exchange, or emotional proximity.[3] Social networks are typically the subject matter of anthropology and sociology, of communication studies as well as political science, but they also play an increasingly prominent role in computer science, economics, history, and medical science. Research topics range from communication networks, the formation of subcultures, and social movements to networks of local power elites, informal networks within and between organizations, and on to personal or private networks, including virtual and semantic networks (cf. Scott 2000; Scott and Carrington 2011).

The particular attractiveness of the network concept lies in the fact that it focuses attention on the "totality" of social relations and their social context and hence on the "embeddedness" of social action (Granovetter 1985). Going beyond single relationships, network research investigates the relations between the various relationships of a network (e.g., the formation of clusters or cliques) and the influence of structural properties of networks and social relations on social integration. For instance, information flow is a lot faster and norms are more effectively established in dense networks where a large number

[3] Even though the linkages between actors are defined by their *content*, the network concept as such rather refers to the *formal structure* of those social relations, e.g., the size of a network, the frequency of interactions between its members (*alteri*), or its density (the number of actual as compared to potential relationships between alteri). Therefore, network concepts are often combined with concepts aimed at the functions or the content of relationships (e.g., concepts capturing social support or social capital; cf. Marsden 1990, 2011).

of people are acquainted with one another than in networks marked by a low density of relationships. At the individual level, dense networks provide more social support but also exert more social control (Coleman 1990). Another well-known structural property of networks are so-called "structural holes" (Burt 1992). Occupying such structural holes gives privileged access to information, power, and influence (Padgett and Ansell 1993).

Due to its relational perspective, the network concept integrates both the societal micro- and macro-levels and offers a specific starting point for tracing the mechanisms of social integration as well as the conditions and implications of social change. Moreno's sociometric studies in the 1930s and American community studies in the 1940s were early antecedents of contemporary network research in the social sciences. The term "social network" was first introduced in the 1950s by British cultural anthropologists who investigated small-scale social settings at the time, such as rural communities, neighborhoods, and subcultural environments (Barnes 1954; Bott 1957; Mitchell 1969). However, it was not until the 1970s that network analysis was established in the social sciences as a distinct empirical paradigm for analyzing systems of social relationships, parallel to the development of its mathematical foundations (cf. Freeman 2004; Knox et al. 2006; Carrington, this volume). Within the scope of this paradigm – known as "structural network analysis" – an extensive set of methodical instruments has been developed since then. Structural network analysis is characterized by the use of highly differentiated standardized methods of data collection (e.g., established name generators like Burt generator, position generator, resource generator, etc.), various measures of network structures (e.g., density and centrality measures), as well as sophisticated analytical procedures and calculation models, comprising block models, random graph models, and as of recently also advanced models for the analysis of longitudinal data (cf. Wasserman and Faust 1994; Carrington et al. 2005; Scott and Carrington 2011; Snijders 2011). As Peter J. Carrington (this volume) points out, precisely this "mathematization of social network analysis" can be assumed to have played a key role in rendering the network concept compatible across a wide range of academic disciplines, thus contributing to its remarkably widespread use.

In spite of the obvious strengths and benefits of the network approach, the structuralist paradigm that has dominated it has also attracted criticism since the early 1990s: Critics claim that the significance of action has been overlooked due to this preoccupation with structure. Such criticism is mainly directed against approaches that are either committed to "structural determinism" (Emirbayer and Goodwin 1994) or involve utilitarian

models of action ("structural instrumentalism"; Emirbayer and Goodwin 1994).[4] According to these critics the challenge of network research is to link the structural level with the actors involved. This would particularly concern the systematic integration of their capacity to act and actively shape their (social) environment as well as their reference to norms, symbols, and cultural practices (Emirbayer and Goodwin 1994; Mizruchi 1994; Schweizer 1996; Emirbayer 1997). As Dorothea Jansen (1999) put it, "A significant theoretical problem [of network research; BH] lies in the sparsely reflected relation between concrete networks and interactions, on the one hand, and subjective attributions of meaning, norms, and institutions, [as well as] cultures and symbolic worlds, on the other. In their dispute with structural functionalism of the Parsonian kind, network researchers have possibly thrown out the baby with the bathwater in claiming absolute priority for concrete structures of interaction vis-à-vis norms and symbolic worlds of any kind" (p. 258 f.; translated from German by BH). However, in recent network research, work has been done that seeks to conceptually integrate agency and to take cultural symbols and norms into account. Research from the quarters of phenomenological network theory comes to mind (White 1992; Mische 2003; Gibson 2005; Yeung 2005).[5] As we will show, mixed methods studies can provide stimulating contributions in this respect as well.

What Do We Mean by "Mixed Methods" in Social Network Research?

Let us now turn to the question of how network research can be positioned in relation to both quantitative and qualitative methods and what

[4] Emirbayer and Goodwin (1994) differentiate three theoretical positions with respect to how social structure, culture, and agency are conceptualized in network research: "The first of these implicit models, that of *structuralist determinism*, neglects altogether the potential causal role of actor's beliefs, values, and normative commitments – or, more generally, of the significance of cultural and political discourses in history. It neglects as well those historical configurations of action that shape and transform pregiven social structures in the first place. A second and more satisfactory – but still deeply problematic – approach is that of *structural instrumentalism*. Studies within this perspective accept the prominent role of social actors in history, but ultimatively conceptualize their activity in narrowly utility-maximizing and instrumental forms. And finally, the most sophisticated network perspective on social change, which we term *structuralist constructivism*, thematizes provocatively certain historical processes of identity conversion and 'robust action.' It is the most successful of all of these approaches in adequately conceptualizing human agency and the potentially transformative impact of cultural idioms and normative commitments on social action" (Emirbayer and Goodwin 1994:1425f.; emphasis in the original).

[5] Other approaches pointing in this direction are symbolic interactionism (Fine and Klineman 1983), Bourdieu's theory of practice, Latour's actor-network theory (cf. Knox et al. 2006), and Luhmann's theory of social systems (cf. Fuhse and Mützel 2010).

"mixed methods" means precisely in social network research. Clearly positioning network research in the spectrum of empirical methods is no easy task if we rely on the common systems for the classification of methodology offered in the literature. Or, in the words of Peter J. Carrington, "Social network analysis itself is neither quantitative nor qualitative, nor a combination of the two. Rather, it is structural"[6] (this volume; similarly Bellotti 2010). Like qualitative methods, network research places special emphasis on the contextuality or "embeddedness" of social action. Yet unlike qualitative methods, network research employs established standardized instruments to this end, and network structures are typically described in terms of measured values and numbers, thus in a formalized or quantified manner. Nevertheless, the concept of representativity usually cannot be applied to network studies – at least not without some restrictions. (For sociocentric or whole networks, it is impossible to determine the statistical population. And if egocentric[7] network data are collected within the scope of representative samples, representative conclusions can only be drawn about the attributes of ego but not about the relations existing with or between the alteri; cf. Belotti 2010). That, of course, rules out the use of inferential statistics, and reliable statements on the prevalence of networks and network structures can be made only to a limited extent. We also have to consider that we are often dealing with relatively small sample sizes, especially when investigating whole networks.

In the following we distinguish quantitative and qualitative network *data* and quantitative and qualitative *strategies of network analysis*. In line with a commonly made distinction, we understand by quantitative data numerical data and by qualitative data data in text form (cf. Bernard 1994). Accordingly, what we call *quantitative network data* refers to all data describing relations, interactions, and structures of networks in formal terms using numbers (e.g., the number of relationships between the members of a network). We speak of *qualitative network data* when aspects of networks are described in text form (e.g., when actors explain the strategies of action adopted vis-à-vis other members of a network).

[6] Or in the words of an anonymous reviewer, "There is an argument that social network analysis, as a method of formal analysis, is not quantitative but uses numbers in order to grasp the quality of social relationships. It is, at the very least, different from obvious quantitative approaches that focus on attributes rather than relations."

[7] Whole (sociocentric), complete, or "entire" networks – e.g., entire communities – are investigated less often. If so, the respondents can, for instance, be selected by means of snowball sampling (on sampling strategies, cf. Frank 2011). In contrast, so-called "egocentered" (egocentric) networks refer to the networks of individual actors who are in most cases the only source of information about their networks (cf. Carrington, this volume; Wald, this volume). The present volume assembles studies on ego-centered as well as on whole networks.

Quantitative strategies of analysis are defined as strategies of data analysis to describe in quantitative terms empirical regularities, the frequency and prevalence of social phenomena, as well as causal mechanisms and processes. The basic strategies of data analysis consist of descriptive measures, statistical methods, and path or causal models. More recently, we are also observing an increasing trend toward computer simulations. In network research, quantitative methods are geared toward mathematical descriptions and analyses of interactions, relations, and network structures. Measured values and numbers, for instance, are density and centrality measures or the triad census (e.g., Gluesing, Riopelle, and Danowski, this volume). More sophisticated analyses apply formal models and statistical procedures, such as block model analysis, exponential random graph modeling, or regression analysis (cf. Wasserman and Faust 1994; Carrington et al. 2005; Scott and Carrington 2011). In this sense, we consider most of the methods used in social network analysis to be "quantitative."

Qualitative analysis refers to all those methods in empirical social research that aim at gaining an understanding of meaning and its frames of reference (cf. Hollstein 2011). Qualitative data will generally come as text and are meant to provide insight into contexts of action as well as systems of meaning. If no such data are readily available, researchers will turn to open-ended methods of data collection, such as interviewing or unstructured observation methods, and interpretive methods of data analysis. Interpretive strategies of data analysis allow one to reconstruct cultural practices and interaction patterns. Moreover, they are especially well suited for capturing the actors' own systems of relevance, perceptions, interpretations, and action orientations. With respect to network research, qualitative methods are therefore most appropriate for investigating network practices and network perceptions and interpretations (cf. Hollstein 2011). In principle, perceptions, attributions of meaning, and systems of relevance can also be investigated with standardized methods (e.g., Maya-Jariego and Dominguez; Gluesing et al., this volume). An open, inductive approach, however, is indicated in cases where the research question is of a more exploratory nature. The same holds true for settings where we expect great variations in individual meanings and/or systems of relevance (cf. Wald, this volume).

As we now have established a more precise understanding of what is meant by mixed methods, qualitative and quantitative data, and qualitative and quantitative strategies of analysis in network research, we can proceed to define more precisely mixed methods in network research. We will speak of mixed methods network studies when three conditions are satisfied: