Preliminary Results of the Niakhar Social Networks Pilot Survey

Steven Rytina McGill University
John Sandberg McGill University
Valérie Delaunay IRD
Richard Lalou IRD

This paper presents the first results from an innovative demographic social network project, the Niakhar Social Networks Pilot Survey conducted by McGill University and *L'Institut de recherche pour le développement* (IRD). This project is the first of its kind to link comprehensive sociometric information (names of social network partners, or alters) to an ongoing Demographic Surveillance System (DSS) in Niakhar, Senegal maintained by. In doing so, this project resolves a number of critical problems in virtually all demographic network research designs.

This paper first lays out the critique of these previous research designs, and the way the design as implemented here addresses them. We then turn to the design, implementation and results of the pilot survey as well as an experimental validation of the name generators used in the survey.

Network analysis, specifically ego-centered network analysis, has recently been thought to hold tremendous promise for understanding the influence of social interaction on demographic behaviors and outcomes (Bongaarts and Watkins 1996; Casterline 2001). Major demographic network projects have been conducted through the University of Pennsylvania and the Population Council. Most previous research, however, has been severely limited by conventional network data designs. These designs necessitate collecting data concerning the characteristics of network alters from the respondents themselves. This has been shown to yield significant and substantively important biases with regards to alter characteristics which necessarily qualify results concerning the association of these characteristics and respondents demographic behaviors (White and Watkins 2000; Montgomery and Chung 1999). Additionally, this type of design, because of costs and logistical concerns, conventionally limits the domains of interaction over which respondents name alters (usually to a specific type of interaction concerning a substantively important demographic phenomena such as the use of contraception or knowledge concerning AIDS) and the number of alters named by respondents, usually limited to between four and five.

The Niakhar DSS has prospectively collected detailed demographic and epidemiological information on a contiguous population of over 30,000 individuals for the last 24 years. The design of the Niakhar Social Networks project, by linking alters names as given by respondents to the ongoing DSS, resolves the problems with conventional ego-centric network designs described above. Relatively objective information concerning alter characteristics is obtained concerning a large number of alters across multiple domains of interaction. This type of design has proved to be important in assessing the relationship between network infant mortality and women's fertility in previous research (Sandberg 2005; Sandberg 2006).

Fielded on a sample of 140 individuals in the IRD project area, the main survey contains names of alters across 14 distinct but related domains of interaction derived from detailed qualitative work in the study area designed to capture the largest possible

number of alters in respondents overall social network. This strategy yields an average total synthetic network size much larger than has previously been identified in the demographic network literature.

In this paper we first present results concerning the matching of named alters in the survey instrument to the Niakhar DSS database. Using detailed information on residence and kin ties collected in the survey, we present a variety of minimal subsets of information necessary for acceptably high levels of unique identification of alters. This process and the algorithms used to arrive at these results will be of interest not only to social network analysts, but many researchers linking individual level data to ongoing population registration systems or administrative records.

Next, we proceed to tabular analyses of the structure of social networks as obtained from this survey, average network size and multiplexity across domains of interaction and in total across strata of gender, age and marital status. We also present results from a separate, experimental validation survey that allows us to assess the degree to which the name generators employed in the main survey instrument capture the full breadth of social networks in the area relative to an extensive list of over 30 other name generators that have previously been used in the social network literature. Based on results from the validation instrument, we also briefly discuss the degree to which name generators commonly used in the network demographic literature (having conversations about contraception and AIDS) adequately capture the extent of the total synthetic networks as identified in the main survey instrument.

From there, we present analyses of characteristics of the relationships between the respondents and their alters. These include the prevalence of sanguinal and fictive kinship ties, the spatial dispersion of alters, the average length of time respondents have known alters, how much time they spend in interaction with them, alters' prominence as measured through hypothetical monetary contributions and a psycho-physical measure of closeness, and results of a specialized test designed to assess the validity of the assumption commonly made in demographic analyses that name generators completely identify individuals within the particular domain of interaction that is the subject of the question.

In closing, we summarize the importance of the design as implemented here in realizing the potential of ego-centered network analyses in relation to demographic phenomena and outline models of network influence that can be achieved with this and future waves of the survey in conjunction the surveillance system data. As an example, we discuss an element of the main survey linking respondents opinions concerning and use of pre-natal health programs and the use of such programs by network alters.

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