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# Social isolation, survey nonresponse, and nonresponse bias: An empirical evaluation using social network data within an organization

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## ABSTRACT

Survey researchers have long hypothesized that social isolation negatively affects the probability of survey participation and biases survey estimates. Previous research, however, has relied on proxy measures of isolation, such as being a marginalized group member within a population. We re-examine the relationship between social isolation and survey participation using direct measures of social isolation derived from social network data; specifically, instrumental research and expressive friendship connections among faculty within academic departments. Using a reconceptualization of social isolation, we find that *social network isolation* is negatively associated with unit response. Among women (a numerical minority group within the organization), we further find that *social group isolation* (i.e., lacking instrumental network connections to men, the majority group in the organization) is negatively associated with survey participation. Finally, we show that some survey estimates are systematically biased due to nonparticipation from socially isolated people.

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## 1. Introduction

Social isolation, or lack of connectedness with other people, has long been hypothesized as a cause of unit nonresponse in sample surveys (Brehm, 1993; Goyder, 1987; Groves and Couper, 1998; Voogt, 2004). Under this hypothesis, people who are disengaged from society or the dominant groups within a society do not share common norms and are less compliant with survey requests. Isolated persons lack the “common cause” of civic engagement that underlies helping behavior and participation in civic events or prosocial organizations (Brehm, 1993; Verba, 1996; Toppe and Galaskiewicz, 2006). Therefore, a request from “society at large” is rejected by those who feel rejected by society (Groves and Couper, 1998).

The purpose of this research is to test this common hypothesis for why individuals do not participate in social surveys. It is important to examine the effects of social isolation on survey nonresponse because our knowledge relies heavily on survey methods to understand how populations think, feel, and act. Survey estimates can be biased when respondents and non-respondents differ on the characteristics being measured in the survey, resulting in nonresponse bias on estimates related to these characteristics (Groves, 2006). One notable limitation to previous research is that ‘social isolation’ is not directly

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measured on both respondents and nonrespondents. Rather, it is inferred from the distribution of responses to questions about social participation or friends among respondents (e.g., Abraham et al., 2008) or based on observable status characteristics of the sample indicating marginalized groups, such as racial minorities or the elderly (e.g., Goyder, 1987).

This study uses a different way of measuring 'social isolation' or 'connectedness' to further understand the relationship between social isolation and unit nonresponse. Specifically, collecting full rank social network data (Wasserman and Faust, 1994)<sup>1</sup> within the context of an organization (a university) makes it possible to directly measure social isolation. All people within the organization are sampled and asked to identify their connections to all the other people in the department, including actors who ultimately do not participate in the survey. Thus, we have a measure of social integration for each sampled person that is independent of whether or not that particular person participated.

Moreover, using social network data allows us to further develop the concept of social isolation. A central focus in social network theory pertains to how network characteristics shape a person's perceptions and behaviors (Borgatti et al., 2009; Wellman, 1988). Most network theories take either a structural or a compositional approach. Structural theories focus on the characteristics of network ties (e.g., Coleman, 1988; Granovetter, 1973), such as network size. Compositional theories focus on the attributes of a person's connections (e.g., Bourdieu and Wacquant, 1992; Lin, 1986), such as having connections to individuals similar or different from oneself (i.e., homophily). Drawing from both theoretical traditions and integrating survey methodological theories on nonresponse, we re-conceptualize the general idea of social isolation into two basic forms: social network isolation and social group isolation. *Social network isolation* pertains to a lack of social connections overall, whereas *social group isolation* identifies a lack of connections to particular social groups. We further examine two different types of social connections or relational tie networks: instrumental research and expressive friendship networks. As such, we can assess variation in the *relational context* of isolation on survey nonresponse.

Integrating research on methods and networks, this study reformulates and tests the social isolation hypothesis for survey nonresponse in Science, Technology, Engineering, and Math (STEM) departments at a large research-intensive Midwestern university. We expect to find that social network isolation in an academic context will predict lower probabilities of survey participation. Within research networks, we further predict the effect of social group isolation to operate differently for the numerical majority group (men) compared to the numerical minority group (women). Finally, because nonresponse bias in survey estimates only occurs when respondents and nonrespondents differ on survey variables of interest (Groves, 2006; Kreuter and Olson, 2011), we combine information from two different surveys on the same sample of faculty to examine nonresponse bias on a diverse set of indicators of faculty work life such as collegiality and work-life balance. We expect a lower survey participation propensity among socially isolated faculty to upwardly bias mean estimates of faculty work life, particularly for concepts related to social interaction among faculty.

## 2. Social isolation and survey participation

A commonly posited cause for survey nonparticipation is social isolation (Goyder, 1987; Groves and Couper, 1998), also called by its converse social engagement, social involvement or social participation (Voogt, 2004; Brehm, 1993). According to the social isolation hypothesis, socially disconnected individuals are likely to lack a sense of obligation to cooperate in surveys (Brehm, 1993; Groves and Couper, 1998; Toppe and Galaskiewicz, 2006; Verba, 1996). Specifically, social isolates tend to be less influenced by the dominant culture, and thus less influenced by commonly invoked survey recruitment themes, such as the norm of reciprocity and power of authority, compared to those who are in more socially integrated positions (Groves and Couper, 1998). Despite the expectations of social isolation reducing the probability that an individual will participate in a survey, tests of this hypothesis rely largely on proxy measures of social isolation.

Two forms of social isolation have been considered with survey participation. First, there is isolation from other individuals (Abraham et al., 2008; McPherson et al., 2006, 2008). For this form of isolation, the primary concern is about *how many connections* a person has, regardless of the personal characteristics of those connections. The lack of social connections to others represents what we call social network isolation. The second form pertains to isolation from dominant social groups and/or society in general (Keyes 1998; Putnam, 2000; Toppe and Galaskiewicz, 2006). In this instance, the main concern is with the *attributes of the respondent*, such as being a racial minority.

### 2.1. Social network isolation

Previous research uses various indirect proxy measures to tap into social network isolation. Typically, social network isolation is measured by questions about social participation, such as involvement in political activities (Brehm, 1993; Groves et al., 2004), neighborhood organizations and neighborhood watch activities (O'Neil, 1979), volunteering (Abraham et al., 2008), and church attendance (Woodberry, 1998). There are three problems with this approach. First, these characteristics only indirectly measure social isolation. Second, little of this work has information for both respondents and nonrespondents (for an exception, see Abraham et al., 2008, which used data from the Current Population Study to predict non-response to the

<sup>1</sup> Full rank network data is different from personal (ego) network data, which relies solely on a single respondent to identify their own network (i.e., reports on the number of collaborators, friends, and so on). It is also different from 'social networks' in the current vernacular of websites such as Facebook, LinkedIn, or Twitter because full rank networks have a clearly bounded set of actors, such as within an organization.

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