



The availability of community ties predicts likelihood of peer referral for mammography: Geographic constraints on viral marketing[☆]

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ABSTRACT

Engaging social networks to encourage preventive health behavior offers a supplement to conventional mass media campaigns and yet we do not fully understand the conditions that facilitate or hamper such interpersonal diffusion. One set of factors that should affect the diffusion of health campaign information involves a person's community. Variables describing geographic communities should predict the likelihood of residents accepting campaign invitations to pass along information to friends, family, and others. We investigate two aspects of a community – the availability of community ties and residential stability—as potential influences on diffusion of publicly-funded breast cancer screening in the United States in 2008–2009. In a survey study of 1515 participants living in 91 zip codes across the State of Minnesota, USA, we focus on the extent to which women refer others when given the opportunity to nominate family, friends, and peers to receive free mammograms. We predicted nomination tendency for a particular zip code would be a function of available community ties, measured as religious congregation density in that zip code, and also expected the predictive power of available ties would be greatest in communities with relatively high residential stability (meaning lower turnover in home residence). Results support our hypotheses. Congregation density positively predicted nomination tendency both in bivariate analysis and in Tobit regression models, and was most predictive in zip codes above the median in residential stability. We conclude that having a local infrastructure of social ties available in a community predicts the diffusion of available health care services in that community.

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Introduction

Who a person knows and how easily they can exchange information with others is likely to be significant for behaviors related to health. Although formal links to medical experts and services undoubtedly make a difference, so do the informal connections in a person's social network. As Tardy and Hale (1998, p. 168) have noted, “mundane conversations occurring in homes, in church basements, at the playground, or even in baseball bleachers” potentially impact health decision-making. We know that engaging social networks as a method for information diffusion can supplement conventional mass media broadcast approaches. (See Southwell & Yzer, 2007, for a review of the intersection of interpersonal communication and

mass media campaigns.) What we do not yet know are the conditions that can facilitate or hamper such diffusion. In particular, can the social context in which people live help account for variation in the diffusion of information from health campaigns? More specifically, to what extent are variables describing geographic communities helpful in predicting the likelihood of campaign invitations to spread information?

A turn toward contextual variation in campaign effects resonates with recent trends in health communication scholarship. Increasingly, health communication researchers acknowledge the multilevel nature of their focal interests, suggesting that variation in key behavioral outcomes is likely a function of both individual-level and community-level forces that can interact to amplify or constrain each other, e.g., Rimal, Ratzan, Arntson, and Freimuth (1997), Bernhardt (2004), Paek, Lee, Salmon, and Witte (2008), or Holmes et al. (2008). This evolving perspective reflects, in part, similar recognition among researchers of the multilevel nature of many communication phenomena, e.g., Pan and McLeod (1991) or Southwell (2005), as well as the wide literature on health inequalities and place, e.g.,

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Cummins, Curtis, Diez-Roux, and Macintyre (2007), Duncan, Jones, and Moon (1993), or Macintyre, Ellaway, and Cummins (2002). Context, whether geographical or historical, likely matters as we attempt to understand why people do or do not respond to campaign invitations to change or maintain health-related behaviors.

In this project, we investigate whether geographical context facilitates or constrains diffusion of opportunities to participate in publicly-funded screening mammography. We focus on the extent to which women in various communities refer other women when given the opportunity to nominate family, friends, and peers to receive free mammograms. Does the social cohesion of a geographic community matter for referral? Does the pre-existing availability of ties between community members enable residents to pass along free screening possibilities to others when the opportunity arises? In order to build the case for an empirical look at these questions, we should consider how and why geography can predict health-related behavior. In doing so, we can engage the umbrella concept of social capital, discussion of which has been wide-ranging in public health, communication, and medical sociology research in recent years. These steps will provide a rationale linking the community-level availability of interpersonal ties to likelihood of interpersonal referral for health care services, especially when social networks are mobilized by programmatic viral marketing efforts.

Geographic variation in health behavior

Geography matters with regard to health behavior, not just as a marker of simple variation but as an indicator of structural, environmental, and social infrastructure differences that facilitate or hamper individual behavior (Cummins et al., 2007; Kearns, 1993, Macintyre et al., 2002; Susser & Susser, 1996a; 1996b). Mobley, Kuo, Driscoll, Clayton, and Anselin (2008) demonstrate why this recognition is useful specifically for understanding cancer screening patterns. They assess heterogeneity in mammography use and conclude that community-level variables (often overlooked in large-sample, pooled analyses of individuals) explain variance in mammography use. For example, they illustrate how the proportion of a local workforce with a long commute predicts variation in screening rates, suggesting transportation problems as a local structural factor affecting use.

Such effects underscore the need for health communication scholars to understand not simply collective or compositional variables (which are typically macro-level aggregates of individual characteristics), but also contextual variables (which are rightly measured at a macro-level, such as a community or state, in which individuals are nested). By incorporating geography into analysis of communication dynamics relevant to health behavior, we can address the call for contextual research sounded widely in recent years (Diez-Roux, 1998; Hillemeir, Lynch, Harper, & Casper, 2003; Pickett & Pearl, 2000).

With regard to referral behavior, namely nomination of a peer for free or subsidized health care services, a number of aspects of one's community could be facilitating or constraining forces. Physical barriers to accessing clinics could constrain enthusiasm for referring others for services, for example. One community-level variable that should facilitate service referral is the extent of structural opportunities for interpersonal connection and bonding. As we discuss below, social ties, conceptualized and measured in various ways, encourage performance of various behaviors, including health behaviors.

Social capital, social cohesion, and available community ties

Within recent health promotion literature, a number of researchers have pointed to the notion of social capital as an

explanation for health outcomes, e.g., Kawachi, Kennedy, Lochner, and Prothrow-Stith (1997) or Derose (2008). Moreover, the belief that communities vary in bonding and social cohesion and that variation might offer different probabilities for intervention success has spurred a host of health interventions based on social network identification and targeting. Husaini et al. (2002), for example, describe an effort to encourage breast cancer screening among African-American women by working through places of worship and voluntary organizations (rather than using a general broadcast approach). Researchers typically justify targeting such community gathering places as effective sites for intervention because they are somehow rich in social capital. Many explicit references to the social capital concept in the health promotion and health communication literature are cursory, at best, however. Social capital presently suffers tremendous ambiguity as a measurable variable, despite its popularity.

Many contemporary discussions of social capital build upon Bourdieu's (1986) delineation of different forms of capital in which he makes a distinction between economic capital, typically considered in terms of monetary value, and social capital, which encompasses the actual or potential resources that stem from having a network of relationships among a group. Being a member of a group means that you can share these resources; you have capital to use or protect. Coleman (1988, 1990) later further conceptualized social capital as a community resource available to individuals but not necessarily located in individuals, per se. (Such a perspective ultimately calls for measurement beyond individual self-report, as we discuss later.)

Research employing social capital as a construct has blossomed in the decades since Bourdieu's and Coleman's initial work, e.g., Kawachi et al. (1997) or Putnam (2000), and aspects of social capital appear to predict a variety of behaviors relevant to our discussion, such as innovation adoption, e.g., Frank, Zhao, and Borman (2004). Health and medical research on social capital nonetheless typically considers the concept in general theoretical terms while measuring it in a variety of idiosyncratic ways. Cummins, Macintyre, Davidson, and Ellaway (2005) have noted an undue reliance on pre-existing survey data for assessment of neighborhood context variables, an overreliance that extends to efforts to measure social capital. We still do not have interdisciplinary consensus on what the construct means or how to measure it.

Recently, scholars have begun to identify and clarify different dimensions of social capital. In one example, Paxton (1999), has demonstrated the utility of separating measures of trust (in individuals and in institutions) from association memberships, illustrating that declines in trust perceptions in the late 20th century United States did not necessarily correspond to similar declines in association membership. Her emphasis on association membership as a unique dimension of social capital is important for our discussion, as the opportunity for association with others is a critical community resource that could facilitate mammography referral (or viral information spread, in general). Some researchers also have distinguished between *bonding* social capital and *bridging and linking* social capital (Beaudoin, 2009; Derose, 2008). Bonding social capital refers to ties within homogenous social networks; bridging and linking social capital refers to cross-cutting ties facilitated by community organizations and organizational networks.

Not all of these efforts to wrestle with the social capital concept, however, have sought simply to clarify various dimensions of social capital. Some scholars, such as Carpiano (2006) or Stephens (2008), have gone even further to argue that much recent usage of social capital as a notion has wandered too far from the concept's roots to be helpful. These scholars point to Bourdieu's original usage, which emphasizes the collective sum of non-monetary resources in a group (which can vary dramatically between classes) as a marker

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