Social Science Research 50 (2015) 15–30

Contents lists available at ScienceDirect

Social Science Research

journal homepage: www.elsevier.com/locate/ssresearch

Latent Class Models in action: Bridging social capital & Internet usage

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ARTICLE INFO

Article history:
Received 29 May 2013
Revised 27 October 2014
Accepted 3 November 2014
Available online 13 November 2014

Keywords:
Latent Class Models
Logistic regression models
Bridging social capital
Internet
Social networking sites
Email

ABSTRACT

This paper explores how Latent Class Models (LCM) can be applied in social research, when the basic assumptions of regression models cannot be validated. We examine the usefulness of this method with data collected from a study on the relationship between bridging social capital and the Internet. Social capital is defined here as the resources that are potentially available in one's social ties. Bridging is a dimension of social capital, usually related to weak ties (acquaintances), and a source of instrumental resources such as information. The study surveyed a stratified random sample of 417 inhabitants of Lisbon, Portugal. We used LCM to create the variable bridging social capital, but also to estimate the relationship between bridging social capital and Internet usage when we encountered convergence problems with the logistic regression analysis. We conclude by showing a positive relationship between bridging and Internet usage, and by discussing the potential of LCM for social science research.

1. Introduction

The relationship between social capital and Internet usage has been an important research area for scholars interested in the social effects of the Internet (Neves, 2013). Social capital is a polysemic concept, with a variety of definitions, but with a core idea: our social ties matter and bring us benefits. These benefits are related to the resources that we can draw from our social ties, i.e., from our social networks. We define social capital as *the resources that are embedded in our social networks and can be accessed and mobilized when needed* (cf. Bourdieu, 1980; Lin, 2001). These resources include social and economic assets, such as social and emotional support or financial help.

Since social capital is a strong predictor of academic performance, occupational attainment, social cohesion, well-being, and civic engagement (Lin and Erickson, 2008; Portes, 1998; Putnam, 2000), researchers use it as a conceptual tool to analyze the social impact of the Internet (Quan-Haase and Wellman, 2004). Despite some moral panic around the effects of the Internet (Turkle, 2011), a decade of research evinces a positive relationship between social capital and the Internet (Boase et al., 2006; Neves, 2013; Robinson and Martin, 2010; Wang and Wellman, 2010). New research trends, however, examine specific dimensions of social capital and Internet usage.

Social capital is measured through different dimensions that include indicators such as quantity and quality of social ties. Putnam (2000) identified "bonding" and "bridging" as the two main dimensions of social capital. Bonding social capital

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http://dx.doi.org/10.1016/j.ssresearch.2014.11.002
0049-089X/

relates to the resources potentially available in strong ties. Strong ties correspond to homogeneous and close-knit groups such as family members and close friends, which are key sources of interaction and support (Hampton, 2011; Haythornthwaite, 2005; Strait, 2000). Strong ties are less diverse in terms of social backgrounds but offer closer interpersonal relationships (Williams, 2006). Bonding social capital provides, for instance, social and emotional support such as having someone to give us a hand when we are sick at home or to babysit our children in an emergency.

Bridging social capital is mainly related to the resources potentially available in weak ties (Hampton, 2011). Weak ties are usually acquaintances, and correspond to more diverse and heterogeneous groups. These ties are more crosscutting than strong ties and provide access to different (and more varied) resources, such as information on job opportunities (Granovetter, 1973, 1974) or other information that is not available in a close social network. In fact, to have access to specific information a person might need to be out of his/her close social network, connecting with ties that belong to other social networks. This connection of ties between two different social networks is called *bridges*. Although these relationships are seen as weak and uncertain, they might provide bridging social capital, i.e., opportunities for new information and resources as well as for widening social perspectives or worldviews (Williams, 2006). The strength of weak ties, as coined by Granovetter (1973, 1974), rests on the evidence that weaker ties lead to more diverse people and consequently to wider opportunities. Bridging is, therefore, mostly related to individuals from different backgrounds connected through social networks. Of course not all weak ties are bridging (Granovetter, 1973), strong ties may also provide bridging – for example, through a friend of a friend – but bridging is primarily accessible through weak ties (Hampton, 2011). Bridging social capital is not the opposite of bonding social capital; they are complementary. Bonding is, nonetheless, seen as more exclusive, whereas bridging is seen as more inclusive (Williams, 2006).

Because the Internet is becoming a pervasive form of communication, we should expect bridging to be enhanced since there are more opportunities to connect with weak ties online (through email, instant messaging, social networking sites, etc.) and to derive resources from those connections (e.g., access to new information) (Steinfield et al., 2008; Williams, 2007). To examine whether there is a relationship between bridging social capital and Internet usage, we surveyed a stratified random sample of 417 inhabitants of Lisbon, Portugal. We estimated the variable bridging social capital with Latent Class Models (LCM), a cluster analysis technique used to find latent classes from multivariate data (Fonseca, 2009). We then carried out multinomial logistic regressions to test for the relationship between bridging and the Internet. As we could not meet the assumptions of logistic regression models, because of convergence problems, we re-used Latent Class Models (LCM) to analyze that relationship. Thus, this paper also discusses convergence failures in logistic regression models, and the application and potential of LCM to the study of bridging social capital and to social science research in general.

2. Bridging social capital and Internet usage

The Internet seems promising in the formation and maintenance of weak ties due to the characteristics of the medium, namely convenience, low entry cost, high speed, easy usage, and ubiquity (Donath and boyd, 2004; Haythornthwaite, 2005; Wellman et al., 2003). These characteristics contributed to a social change in the way people communicate with social ties, moving them towards *Networked Individualism* (Wellman, 2001). Networked individualism is a new form of connectivity that involves sparsely knit communities and the connection of individuals without many of the common geographic constraints:

> Moving around with a mobile phone, pager, or wireless Internet makes people less dependent on place. Because connections are to people and not to places, the technology affords shifting of work and community ties from linking people-in-places to linking people wherever they are. It is I-alone that is reachable wherever I am: at a house, hotel, office, freeway or mall. The person has become the portal (Wellman, 2001: 15).

The Internet allows people to be part of large networks of interest, to interact with a variety of ties, and to manage that interaction. For instance, the individual can be interacting online with different ties, while doing other things at the same time (Hogan and Quan-Haase, 2010; Resnick, 2001). These social affordances of the Internet make it a useful medium to meet and maintain weak ties and to access, accrue, and mobilize bridging social capital (Boase et al., 2006; Wellman et al., 2003). For example, the Internet facilitates the creation of new ties (on a social networking site, such as Facebook) and the activation of latent ties, those ties that are dormant but not yet activated, such as a friend of a friend that we meet on a social networking site (Haythornthwaite, 2005).

Since social practices online could be distinct from offline practices, Williams (2006) developed an instrument to measure online and offline bonding and bridging (*Internet Social Capital Scales*). Using this instrument in a sample of U.S. inhabitants ($N = 884$), Williams (2007) found more bridging online than offline, suggesting that the opportunity for bridging is more available online than offline (probably because of the social affordances of the Internet).

Research on specific online activities, in particular social networking sites (SNSs), also indicates a positive association between bridging and the Internet (Brandtzæg et al., 2010; Burke et al., 2011; Ellison et al., 2007; Steinfield et al., 2008). Yet, in a longitudinal study of a representative sample of Norwegian online users ($N = 2001$) in three waves, 2008, 2009, and 2010, Brandtzæg (2012) found that the number of acquaintances correlated with SNS usage, but not with bridging or face-to-face interaction. These different results might be related to cultural aspects and to the study of other types of SNSs, age-ranges, and measurements. Whereas the aforesaid studies used the *Internet Social Capital Scales*, Brandtzæg's study was based on indicators such as number of acquaintances, frequency of face-to-face interactions with close friends, and a