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Assessing structural correlates to social capital in Facebook ego networks

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ABSTRACT

Research in computer-mediated communication has consistently asserted that Facebook use is positively correlated with social capital. This research has drawn primarily on Williams' (2006) bridging and bonding scales as well as behavioral attributes such as civic engagement. Yet, as social capital is inherently a structural construct, it is surprising that so little work has been done relating social capital to social structure as captured by social network site (SNS) Friendship networks. Facebook is particularly well-suited to support the examination of structure at the ego level since the networks articulated on Facebook tend to be large, dense, and indicative of many offline foci (e.g., coworkers, friends from high school). Assuming that each one of these foci only partially overlap, we initially present two hypotheses related to Facebook social networks and social capital: more foci are associated with perceptions of greater bridging social capital and more closure is associated with greater bonding social capital. Using a study of 235 employees at a Midwestern American university, we test these hypotheses alongside self-reported measures of activity on the site. Our results only partially confirm these hypotheses. In particular, using a widely used measure of closure (transitivity) we observe a strong and persistent negative relationship to bonding social capital. Although this finding is initially counter-intuitive it is easily explained by considering the topology of Facebook personal networks: networks with primarily closed triads tend to be networks with tightly bound foci (such as everyone from high school knowing each other) and few connections between foci. Networks with primarily open triads signify many crosscutting friendships across foci. Therefore, bonding social capital appears to be less tied to local clustering than to global cohesion.

1. Introduction

With more than one billion active users, Facebook is the most widely used social network site (SNS) in the world (Facebook, 2013). Users employ Facebook to maintain relationships with existing friends (Ellison et al., 2007; Hampton et al., 2011), reconnect with old friends (Smith, 2011), organize social engagements (Ellison et al., 2013), and seek information from their connections on the site (Lampe et al., 2012; Morris et al., 2010). To assess the potential benefits of Facebook use, researchers have regularly used the notion of social capital—a sociological framework which captures both the potential and actual resources available from an actor's network (Bourdieu, 1986; Lin, 2001; Putnam, 2000). In particular, there is an expanding body of research that employs the distinction between "bridging" and "bonding" social capital (Gittell and Vidal, 1998; Putnam, 2000) to characterize the potential benefits of Facebook engagement. This distinction was popularized by Robert Putnam, who argues that community organizations work as engines of bonding social capital by bringing together individuals for shared events and group solidarity (2000). Bridging social capital can be traced to Granovetter's (1973) articulation of how weak ties enable access to novel information (and consequently greater job search success). Since Facebook houses both dense clusters of strong ties (Gilbert and Karahalios, 2009) and large swaths of weak ties, it is plausible that Facebook can be a site for the activation of both bonding and bridging social capital.

Although social capital has its roots in structural analysis, the bulk of social capital scholarship in computer-mediated communication concerning Facebook has focused on survey scales that relate perceptions of social capital to individual-level metrics such

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as self-esteem, messages sent, and attitudes toward Facebook. In particular, many researchers have used Williams (2006) Internet Social Capital Scales (ISCS) to claim that specific characteristics of users' networks (e.g., Ellison et al., 2011; Vitak, 2012) and users' behaviors on the site (e.g., Burke et al., 2011; Ellison et al., in press) positively predict perceptions of social capital. When these studies take network composition into account they tend to use network size. On the other hand, there is a small body of research that explicitly examines ego-centric measures of network structure on Facebook. However, these studies tend to take network structure *as* social capital (Brooks et al., 2011) or examine social cohesion more broadly (Friggeri et al., 2011).

In this study we jointly consider the structural properties of Facebook networks, scales of bridging and bonding social capital, and measures of site engagement. In doing so, we wish to extend past research that has examined individual level variables, such as time on the site, while explicitly considering the potential for structural-level metrics to have an independent effect on perceptions of social capital. Consistent with Brooks et al. (2011) and Friggeri et al. (2011), we assume that dense clusters of ties have a significant bearing on the overall cohesion of the network, and therefore, the likelihood of resource provision from the network. Consistent with other work in this vein (e.g., Burke et al., 2011; Ellison et al., in press), we use a modified version of Williams' (2006) Internet Social Capital Scale (ISCS) to measure perceptions of social capital.

One of the attractions of researching Facebook ego networks is that information about virtually all alters is available programmatically. This allows us to operate at a scale in between two established strategies for capturing ego networks: name generators, which tend to focus mainly on the small number of core social ties (McPherson et al., 2006), and enumeration methods, which tend to focus on estimating total network size but forgo alter–alter connections (McCarty et al., 2000). Although Facebook networks are only approximations of offline personal networks, they nevertheless include large swaths of weak ties and the alter–alter connections between these weak ties. Further, past work has shown that the relationships on Facebook tend to be characteristic of offline relationships (Ellison et al., 2007), and that activity on Facebook is able to discriminate offline strong and weak ties (Gilbert and Karahalios, 2009; Jones et al., 2013).

As our findings suggest, one of the further advantages of using Facebook networks is that we can assess with high fidelity the consequences of linkages across social groups that may not necessarily be obvious to ego, but still felt as a form of social cohesion. In most ego network analysis studies alter–alter ties are reported by ego, and thus subject to a host of inaccuracies and biases (Bernard et al., 1984). Thus, the network that is analyzed is not a list of friendships as articulated by the friends, but a list of friendships as seen through ego's eyes. In this regard, we extend Friggeri et al. (2011), by considering the cohesion of the network as a whole, rather than the cohesion of distinct clusters within the ego network. Whereas Friggeri et al. use closed triads to signify distinct social groupings; we suggest that the presence of open triads may in fact be a better measure of global cohesion, and that the presence of many closed triads (relative to open triads) is in fact a strong indicator that the ego network is highly fragmented. Each individual cluster might be tightly knit, but the lack of open triads indicates a lack of connections *across* groups, and potentially a lack of social cohesion in the network.

This paper is organized as follows: First, we review the use of social capital in studies of computer-mediated communication and social network analysis. Second, we summarize current scholarship examining Facebook, both as a resource for social capital and as a personal network measurement tool. We then define our basic research questions and hypotheses followed by our methodological approach, variable conceptualizations, and descriptive data about our participants. We then present the results of a series of bivariate and multivariate analyses and conclude by discussing how network structure can partially influence the perception of social capital in ego networks on Facebook. In general, we assert that individual attitudes to Facebook usage remain the strongest explanatory factors for social capital, but that structural measures, particularly triadic closure, can have a strong independent effect. Perhaps most interesting, this effect of triadic closure is opposite to what would be assumed – a higher clustering coefficient is actually associated with less bonding social capital. We argue that this is the result of less open triads across groups and is experienced by ego as a network that is "fragmented" rather than globally cohesive.

2. Literature

2.1. Conceptualization of social capital

Social capital—the "aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships" (Bourdieu, 1986, p. 51)—has been adapted and integrated into a large number of academic fields. Scholars have explored the presence of social capital in politics, religion, education, family, and culture. In all cases, social capital tends to be a general stand-in for positive social outcomes from social interaction. The prominence (and perhaps the dilution) of the concept of social capital has led members of the social network analysis community to criticize the notion of the concept as being overly general, instrumental and artificial (Kadushin, 2004; Fischer, 2005; Fine, 2010). However, there remains a plausible need to consider how structural features and individual behaviors lead to differences in perceptions and outcomes of social resources. Facebook is not solely a site for sharing music tastes, comparing opinions on current affairs, or organizing social events. Rather, it effectively functions as a computer-mediated platform for all of the above. Thus, our operationalization of social capital emphasizes attitudinal sentiments, and any descriptions of these resources as processes that can be invested or traded are ancillary. We focus on the question of whether individuals believe they can draw upon their network for emotional and material resources (as a measure of bonding social capital) and whether individuals believe their network connects them to the wider world and provides them with new information and experiences (as a measure of bridging social capital).

Robert Putnam is widely regarded as popularizing the distinction between bridging and bonding social capital (even if the distinction is often attributed to the previously published Gittell and Vidal (1998)). In *Bowling Alone*, Putnam argued that community organizations enabled individuals to converge in shared locations and engage in activities that increase group solidarity. He asserted that these organizations were associated with a large number of positive outcomes, such as greater health and lower crime. Furthermore, he postulated that television was among a number of factors that might be responsible for the decline in voluntary activity and an associated decline in social capital. At the time of its publication, the Internet was only beginning to emerge as an object of study for social capital in everyday life and Putnam remained agnostic about its consequences for public life. Subsequently, a number of scholars explored whether the Internet impeded social capital, by taking time away from "offline" activities (cf., Nie et al., 2002) or enhanced social capital, by providing increased connectivity within the personal network (Quan-Haase and Wellman, 2004).

Williams (2006) addressed the growing popularity of CMC as a method of communication—and thereby a separate outlet through which social capital could be created and exchanged—by