



Making friends and communicating on Facebook: Implications for the access to social capital



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ABSTRACT

In this paper, we explore the dynamics of access to social capital on Facebook. Existing approaches to network-based social capital measures are adapted to the case of Facebook and applied to the friendship and communication data of 438,851 users. These measures are correlated to user data in order to identify advantageous behavior for optimizing the possible access to social capital. We find that the access to social capital on Facebook is primarily based on a reasonable amount of active communication. Exaggerated friending and posting behavior can deteriorate the access to social capital. Furthermore, we investigate which kinds of posts are most advantageous as well as questions of homophily based on social capital.

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1. Introduction

The increasing importance of SNSs for maintaining our social relations cannot be neglected. Users appreciate the possibility to communicate in an often asymmetric way with many hundreds of “friends” or “followers”. On the one hand, the flood of information can be challenging, on the other hand, this way to communicate is said to reduce the effort to build and use social capital.

What is social capital? Lin (2002) summarized the perceptions of influential scholars in the field by “investment in social relations with expected returns in the marketplace”. These investments and returns occur in, for example, the form of knowledge, trends, ideas, news, and opinions. Sociological literature distinguishes two types of social capital: bridging and bonding social capital (Putnam, 2001). Bonding social capital refers to benefits arising from close relations inside of cohesive groups, while bridging social capital is built between groups. Many recent studies are concerned with the question of whether the new communication media arising from the Internet, and especially from SNSs, increase the two types of social capital. Literature seems to agree that the use of Facebook and other social media is positively correlated with bridging social capital (Ellison et al., 2007; Shah et al., 2012; Steinfield et al., 2008) and

an increase of the number of weak ties (Donath and Boyd, 2004). Moreover, Steinfield et al. (2008) found on the basis of a longitudinal analysis that Facebook use led to bridging social capital rather than the other way around. Burke et al. (2011) pointed out that receiving messages from Facebook friends contributes to bridging social capital, while other activities on Facebook do not. However, it is unclear whether bonding social capital is boosted by Facebook use (Ellison et al., 2007, 2011; Vitak et al., 2011). Both types of social capital are not affected by online relations to strangers (Ellison et al., 2011). SNSs seem to be most valuable to people with lower self-esteem, weaker social capabilities, or lower life satisfaction (Burke et al., 2011; Ellison et al., 2007; Steinfield et al., 2008).

The cited articles measured social capital by means of surveys with questions like “I am interested in what goes on at [my community]” and “[my community] is a good place to be”. Social network research usually follows a sociometric approach: Burt (1995) contributed one of the major social network theories related to social capital. He argued that individuals could build social capital by bridging missing ties between subnetworks (called structural holes). By adopting the position of a broker, the actor could access and control the information flow between the two otherwise separated groups, which increases its attractiveness for other actors in the network. Besides brokerage, social capital can also be determined by centrality, homophily, and density measures and the reciprocity of relationships (Monge and Contractor, 2003; Borgatti et al., 1998; Burt, 2000; Lin, 1999). In this paper, we will undertake a sociometric approach to measure the possible access to social capital on Facebook. We argue that although the number of friends might be one ingredient of social capital, the actual communication ties allow for much more valuable insights. Therefore, we

Abbreviations: API, application programming interface; app, application (software); SNS, social networking sites.

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develop sociometric measures capturing the access to social capital adapted to the Facebook communication features. We propose five hypotheses based on sociological, psychological, and social network theories concerning factors influencing the access to social capital on Facebook. Furthermore, we use regression models to reveal the most important main effects and possible interactions between predictors.

2. Relevant communication features on Facebook

The subsequent sections require some knowledge about relevant Facebook functionalities that we briefly review here: In essence, the purpose of Facebook from a user perspective is to become virtual friends with other users, to communicate with them, and to stay informed about their activities and interests. Friendships are established when a user sends a friend request to another user and the latter accepts the request. From this point, friends can usually read each others' "posts". Posts are unaddressed text messages, possibly enriched by photos or videos, that can be commented on and "liked" (by clicking a "like"-button). They appear on the users' "news feeds", a collection of friends' posts and notifications of other activities of friends (e.g. when someone changed his/her profile picture). Users can post on their own "walls" or on their friends'. Walls show all posts and notifications related to a certain user (whereas news feeds show posts of all of a user's friends). Users can also tag friends in their posts. This way, the post does not only appear on the user's wall, but also on the tagged person's wall. Friends' privacy settings and filter options set by the user determine which posts and notifications appear on news feeds and walls.

3. Measuring the access to social capital on Facebook

Social capital consists in the exchange of knowledge, trends, ideas, news, and opinions. As opposed to economic capital (money and goods) that is exchanged by means of physical transportation or bank transfers, social capital is exchanged through communication. In a network of bank transfers we can evaluate the financial power and stability of institutions based on their structural position. In a network of communication ties we can measure the ability of members to access (and provide) the various forms of social capital. This is independent of the question of whether persons make use of their social capital (e.g. whether they actually apply for the job they heard about; Lin (1999)). However, the ability to access social capital is manifest. In contrast, the non-existence of communication ties makes it impossible to access social capital. Naturally, the existence of a communication tie does not necessarily mean that social capital has been transferred. However, seemingly unimportant chats commonly serve to prepare for the transfer of social capital in the future (Sobel, 2002). Previous studies, such as Valenzuela et al. (2009) confirmed that there is social capital on Facebook in terms of life satisfaction, trust, and participation.

Social structure is not equal to social capital. Instead, social capital is rather derived from social structure, as pointed out by Portes (1998), or, as formulated by Adler and Kwon (2002), "social capital is the resource available to actors as a function of their location in the structure of their social relations". A very similar definition was proposed by XXXX. Based on this idea, a number of appropriate measures were summarized by Borgatti et al. (1998) and further theoretical considerations were elaborated by Burt (2000) and Lin (1999, 2002). In summary, social network literature proposed two opposing theories about the structures and measurement of social capital:

- The network closure argument, elaborated by Coleman (1988), for example, suggests that a strong interlocking of entities in a dense network created social capital. This perception corresponds to bonding social capital. A number of arguments support this viewpoint: first, as the information quality decreases with the path length, direct connections are most adequate to deliver reliable information. Second, direct connections favor the creativity output of a network, which make this organizational structure adequate for many types of corporate- or leisure-related goals. Third, a dense network is more stable against node removals. That is, the risk of losing the investment in relationships is diversified. Forth, nobody can escape the social control and sanctions of peers, which builds trust. Network measures related to this approach include degree, density, closeness, and page rank, for example.
- Burt (1995) argued that bridging structural holes was a recipe for building social capital. This concept is related to bridging social capital. The structural holes idea was developed in the context of economic theory. Burt argues that persons in bridging positions could benefit from competitive advantages by accessing and controlling the information flow between two otherwise unconnected groups. While information in cohesive groups is usually redundant, bridging positions allow for the reception of different information. Furthermore, the broker can decide to establish further contacts between groups and help both of them to benefit from collaboration. Both parties will attribute those benefits to the broker. These ideas can easily be transferred to the context of friendship networks. Betweenness is commonly used as a measure for bridging positions.

The two structures are opposing because they can never coexist on the same node set. There are no structural holes in a closed network. However, both structures can appear on different node sets in the same network. Everyone's ego network is probably characterized by dense parts representing close family, friends, and coworkers as well as by some contacts hardly knowing anyone else in the network. For this reason we calculate the following measures capturing the access to both types of social capital. All those measures are based on communication networks (where edges represent the number of likes and comments), not on friendship networks.

- Access to rather bonding-like social capital
 - **Reactions** R : the number of likes and comments that ego received on his or her posts. This measure is based on the concept of indegree, a frequently used measure of social capital. We presume that social capital is the larger the more reactions on posts someone receives. Likes and comments persons contributed to their own posts are ignored. The measure of R is defined on $[0, \infty)$.
- Access to bridging social capital
 - **Betweenness** B is the share of shortest paths (geodesics) going through the focal node: $B(i) = (g_{j,k}(i))/(g_{j,k})$ where i is the focal node, $g_{j,k}$ is the number of geodesics between node j and node k (two of i 's friends) and $g_{j,k}(i)$ is the number of geodesics between j to k going through i . $B(i)$ is the higher the more structural holes are bridged by i . B is defined on $[0, 1]$.

Sometimes, the reciprocity of ties is used as a dimension of social capital (see e.g. Monge and Contractor, 2003). The idea is to consider the direction of ties as clearly asymmetric relations can indicate outstanding popularity or inferior social positions. We subscribe to this viewpoint and we operationalize it on the basis of ratios of outgoing and incoming ties.

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