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**Measuring latent ties on Facebook: A novel approach to studying their prevalence and relationship with bridging social capital**

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**Measuring *latent ties* on Facebook: A novel approach to studying their prevalence and relationship with bridging social capital**

Key words: Facebook, *latent ties*, bridging social capital, measure

## MEASURING LATENT TIES ON FACEBOOK

### **Abstract**

The goal of the current study was to develop an empirical measure of *latent ties* on Facebook. We begin with a brief literature review of the influence of social media use on social capital and how *latent ties* fit into this literature. *Latent ties* are defined as ties with whom a connection is made possible by an affordance of a technological platform, such as the Facebook friend list, but with whom one never communicates. *Latent ties* have often been considered beneficial for garnering bridging social capital, but their prevalence and relationship to social capital has not been measured empirically. In the current study, we describe a novel approach for measuring *latent ties* by questionnaire. In a sample of 164 participants, we found that nearly 40% of Facebook users' networks were *latent ties*. Furthermore, the percent of *latent ties* in users' networks was negatively associated with bridging social capital. Finally, we examined the discriminant validity of the *latent ties* measure, and found that the percent of *latent ties* in one's Facebook network and the total number of Facebook friends (network size) were unrelated. Results are discussed in regard to possible uses of this measure of *latent ties* in future research.

**Measuring *latent ties* on Facebook: A novel approach to studying their prevalence and relationship with bridging social capital**

**1.1 Introduction**

The expansion of social media use has led to changes in the ways we manage our social networks and social capital. Users of social media may incur both benefits and risks in choosing to manage social relationships online. Benefits may include garnering large networks of social contacts and both bridging and bonding social capital, but the affordances of social media also can contribute to risks such as the commercialization of identity, context collapse, and *latent ties*. In the current article we will begin by discussing the beneficial and detrimental effects of social media use on social capital, followed by the description of a measure of one of the less researched consequences of social media use, *latent ties*. We defined *latent ties* as ties with whom a connection is made possible by an affordance of a technological platform, but with whom one never communicates. We hope by providing a quantitative measure of *latent ties* that researchers will be able to delve into the beneficial and detrimental effects of *latent ties* on social media, and particularly on Facebook.

Facebook is a social networking website, created to connect people through the Internet. The website was designed with the assumption that having more social connections is useful [1]. As such designers of the website made adding friends as easy as possible. Adding a friend on Facebook consists simply of searching for their name and clicking “Add Friend.” The ease of adding ties contributed to a rapid expansion in the number of Facebook friends in users’ networks. In a longitudinal study [2] university students’ friend counts increased from 201 to 302 from 2006 to 2007. Average friend count has continued to grow over time; for example, a study conducted in 2012 [3] reported 440 Facebook friends on average in a sample of university students. In another more recent study, conducted in 2017, university students reported even larger networks composed of 488 Facebook friends [4].

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Larger networks may have beneficial and/or detrimental effects on overall amounts of social capital and may be influencing how people garner social capital online. These effects will be discussed in the following literature review.

### **1.2 Social capital definition**

Alexis de Toqueville, a Frenchman visiting the United States in the early 1800's as an amateur anthropologist, observed the first signs of social capital in America. He noted that town hall meetings and high levels of information sharing gave people more power over the government and encouraged them to be part of the democratic process [5]. Since de Toqueville's early attempts at informally describing social capital, other researchers have provided more concrete definitions of the concept. One of the most well-known definitions of social capital comes from Putnam [6] who defines social capital as the value that networks possess due to the reciprocity, trustworthiness, and sense of connection that people feel within the network and suggests that larger networks of contacts contribute to having more social capital. Putnam also distinguishes two types of social capital: bonding and bridging. Bonding social capital is the type of social capital that tends to result from close relationships and provides emotional support and advice in times of need. Bridging social capital typically results from connections to more distant ties, especially ones in other social groups. These more distant ties serve to provide novel information that could be beneficial financially or otherwise from other social groups that one would otherwise not have access to from close ties, such as information about job openings [7]. They can also serve to mobilize political awareness or action. Thus, the more social capital one possesses the more potential power one has to influence social norms and the government. Since Putnam's original work on declining social capital in the US, social networks have moved online via social media platforms. These social media platforms such as YouTube, Instagram, Twitter, and Facebook provide users with the unprecedented ability to maintain enormous networks of contacts and

communicate efficiently with them. This movement of social capital online has created benefits and risks.

### **1.3 Beneficial effects of social media use on social capital**

Over the past decade researchers have noticed an increasing preoccupation in preadolescents, adolescents, and young adults with fame [8,9]. This obsession with fame dovetails the development of “micro-celebrities” online [10]. Seeing these success stories may cause individuals to believe that becoming an influencer on Instagram or opening a Facebook business is possible for everyone and therefore can motivate users to create expansive networks for this purpose. Another reason for youths’ desire for fame may be that societal values around what is private and public life may be changing. For example, Hearn [11] suggests that individuals have inculcated consumerist values and therefore feel a need to be constantly productive. Gamson [12] pushes this idea even further in suggesting that elements of private life may not be considered valuable if they are not shared publicly or if they do not have an economic purpose.

The benefits of social media do not only extend to fame and fortune. Other users may see social media as a tool to reach out to people who share similar characteristics and can thus provide bonding social capital. For example, LGBTIAQ+ individuals have long been using the internet to find supportive communities in chat rooms and more recently in Facebook groups [13]. YouTube is also a space where queer youth can find support. For example, YouTuber Nathalie Wynn, also known as contrapoints, talks openly about her transition and struggles with gender dysphoria while trying to combat prejudice against trans people. More specifically concerning Facebook, in a recent study conducted in Hong Kong, where negative attitudes about homosexuality are common, individuals who used Facebook more intensely to contact other LGB individuals were able to garner bonding social capital and as a result experience greater well-being [14]. Furthermore, these individuals became more comfortable

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with expressing their identity and felt less stigma. Other studies with college students have also shown that using Facebook is associated with greater bonding social capital [1,15].

Beyond economic and social motivations, social media users may also leverage the large audiences they can create on these sites for collective good. Virtual cosmopolitanism, or using online communication to create intercultural understanding and promote human rights, can also be a direct result of social media use [16]. Instagram, Twitter, YouTube and Facebook are particularly well adapted to this purpose as individuals can easily share photos and textual messages about social concerns with a large network of contacts instantly. For example, Cameron Kasky, a survivor of the Parkland school shooting, began tweeting about his experience using the hash tag #NeverAgain. Along with other students at the school also using their social media networks, they were able to organize a national protest in Washington, D.C. with over one million people present to raise awareness about gun violence and to put pressure on politicians to change gun laws. This type of transition from online communication to offline action is one of the main benefits of bridging social capital proposed by Putnam [6].

Bridging social capital, beyond motivating action, also serves to create a feeling of interconnectedness to humanity [6,17]. It has been described as the type of social capital individuals have when they make connections (bridge) between multiple social groups, whether they be social classes or cultural groups. Many studies have linked Facebook use with bridging social capital [2,15]. These researchers suggest that the ability to maintain ties via social media with which one would have otherwise lost contact allows people to remain connected to multiple social groups. For example, college students might have trouble maintaining relationships with friends from high school without the aid of social media, but with social media they become a bridge between their old high school and new college social groups.



### 1.4 Detrimental effects of social media use

Although certain researchers have relatively sanguine views on the internet and social media and the positive influences they have on social life [2,13,18], other researchers have begun to pose questions about the risks associated with communication online [19,20]. One of the risks that has been put forward concerning the desire for fame is that this desire for celebrity has been associated with elevated levels of narcissism [20]. This effect may be linked to the need for self-branding when creating an online persona in order to attract a large audience [19]. Self-branding is an idea that parallels the branding of products where users must create an identity that is unique and allows them to distinguish themselves from others while also presenting themselves as authentic and positive role models in a certain area (ex. Health, fitness, beauty, music, comedy, etc.). One obvious problem with self-branding is that it causes people to view social interactions as transactional, they are literally trying to sell themselves, or at the very least the identity they have created [19]. Thus, the goal of interacting with others is commercial and not social. Furthermore, this desire for commercial gain has pushed some Instagram influencers to create false identities that can cause harm in society. One example is the Australian Instagrammer, Belle Gibson, who promoted the idea that a healthy diet had cured her brain cancer. Her success before being exposed as a fraud stemmed from the fact that her discourse about being able to control uncontrollable events in the body is societally condoned and therefore appealed to a large audience.

Other users who are not as savvy about what types of self-branding may appeal to large audiences may encounter a different problem called context collapse. Context collapse occurs when different social groups that a user belongs to observe that a user's online identity is not congruent with the identity they have presented in other contexts [21,22]. For example, a Facebook user may present themselves as being upbeat and optimistic with their friends, but when their family looks at their Facebook page and knows that the user is in fact depressed,

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they may have questions about why the user is not being authentic online. Negative instances of this type of context collapse have been termed context collision [23]. These types of context collapse may lead to being ostracized from social groups or at the very least needing to explain one's online behaviors. One way to prevent context collapse is to self-censor by sharing less information online, but self-censoring means that users may not be able to garner social capital from their online connections [24].

One of the results of the expansion of online communication, including social media use, is the formation of *latent ties*. Haythornthwaite introduced the idea of « latent ties », described as “a tie for which a connection is available technically but that has not yet been activated by social interaction” [25, p. 389]. Haythornthwaite proposed a shorter definition of latent social network ties as social ties that are “technically possible but not activated socially” [26, p. 137]. Social media users may accrue *latent ties* is because of time constraints on maintaining expansive networks [27]. Users of social media may find it difficult to remain in active contact with hundreds or even thousands of contacts. Although, Haythornthwaite postulated that *latent ties* can increase bridging social capital by providing access to new social circles [25], some research suggests that active communication with one's online ties is necessary in order to garner social capital [28]. However, to date no researchers have developed a measure of *latent ties* to test these competing hypotheses empirically. Therefore, in the current study, we propose a novel qualitative measure of *latent ties* based on Facebook that could foreseeably be adapted to other social networks, as well. We hope that our measure can contribute to a fruitful empirical examination of how *latent ties* may influence social media users' social capital, relationships, and overall well-being.

### **1.5 Measuring *Latent ties* on Facebook**

Although expanded social networks can provide opportunities for fame, societal influence, and bonding social capital which can benefit both mental [29] and physical health

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[30], there may be a limit to the positive effects of adding ties to one's network [31]. While Facebook allows for efficient communication via text and visual information, actively maintaining contact with over 400 friends may not be possible due to cognitive limits, time constraints [27], and the bystander effect [32]. This may result in users having Facebook friends with whom they do not actively communicate or never communicate. These ties would be defined as, *latent ties*, or individuals who are on one's Facebook friends list (making a connection technically possible) but with whom one never communicates. Furthermore, even users with smaller networks may have *latent ties* because leaving ties on one's friend list is easier than actively defriending them.

Certain researchers and theorists [2, 15,25,26] have postulated that an increased number of *latent ties* would have benefits specifically for access to bridging social capital (SC). Bridging SC [6] has been defined as informational resources and feeling connected to the world<sup>A</sup>. *Latent ties* may have the potential to provide novel informational resources particularly on Facebook where information can be gleaned through passive use such as browsing the newsfeed.

Although some Facebook researchers were enthusiastic in their assessment of how *latent ties* could influence social capital in their early work [2, 15], paradoxically they never directly measured *latent ties*. Furthermore, based on empirical inquiry, it has been suggested that *latent ties* might not be beneficial. For example, one study [33] indicated that communication with Facebook friends is important, because simply collecting many Facebook friends is not sufficient for garnering SC. Additionally, another study [31] found that number of communication partners is a better predictor of SC than total number of

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<sup>A</sup> Although in the literature another type of social capital, bonding, has been defined as providing emotional and material support, it is generally given by close ties who have a strong bond. Therefore *latent ties* would be unlikely to have a positive influence on bonding social capital and was not considered in the present study.

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Facebook friends. These results suggest that having *latent ties* may not increase SC, and users must actively communicate with Facebook friends to benefit from them.

To our knowledge, no study has empirically measured the prevalence of *latent ties* on Facebook and examined their effects on bridging SC. This may be due to the difficulty of empirically measuring social networks both on and offline. For example, researchers in sociology who began work on social networks long before the invention of social media found that how participants were asked about members of their social networks influenced who and what types of relationships they would include in their responses [34,35]. One researcher working on the General Social Survey, used to study the offline social networks of Americans, found that open ended questions were more tiring for participants and biased their responses toward close relationships [34], perhaps because these are the most emotionally salient and therefore the most likely to be recalled [36]. Therefore, when studying more distant relationships such as *latent ties* an alter-centered approach may be better adapted. An alter-centered approach to collecting relationship data involves giving participants an exhaustive list of names and asking them about their relationship and interactions with each individual. While this method may work well in closed networks where all group members are known (ex. Classes, companies, families), it becomes more difficult when the network is large or non-bounded and potentially unlimited (ex. Fans of a sports team, Facebook contacts) [36].

Due to our interest in distant relationships, the open-ended method was not adapted to our purpose, but the alter-centered method also posed problems because we expected our participants' Facebook networks to be large based on previous research [2,3,4] and asking for all contacts in their Facebook list would have been an invasion of privacy. Thus, we adapted the alter-center method in a way that we thought was acceptable to account for these limitations by using a list of possible relationships that individuals might have within their

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Facebook contacts. Because we were studying college students we drew on lists of relationships used in other studies on online relationships that were conducted on this population [3,15]. These studies often distinguish between old friends and acquaintances from high school as well as new friends and acquaintances in college. They also include more distant relationships like strangers and people met while traveling. This will allow us to observe a diverse number of relationships without fatiguing participants by asking about all of their Facebook contacts and also avoid privacy concerns by not asking for an exhaustive list of all of their current Facebook contacts.

### 1.6 Current study

The aim of the current study is to fill the gap in the literature concerning *latent ties* by providing a novel quantitative approach to measuring *latent ties* on Facebook via a self-report questionnaire. Based on the definition of *latent ties* as people with whom one is friends on Facebook but with whom one never actively communicates, we report the percent of *latent ties* in users' networks, and examine their relationship with bridging social capital. Finally, we examine the discriminant validity of the *latent ties* measure by examining its relationship with total number of Facebook friends.

## 2 Methods

### 2.1 Participants

One hundred sixty-four participants, who reported being Facebook users, were recruited from first-year psychology classes at a medium-sized university in the western United States (75 men, 89 women,  $M_{\text{age}} = 18.82$ ; Range: 18 - 50). Participants completed questionnaires online and were given research credit. Over 95% reported being Facebook users for over 3 years. The other 5% had used Facebook for less than 3 years. In our sample, 21% percent logged into Facebook more than five times per day, 48% percent logged in one

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to five times, and 31% percent logged in less than one time. Participants in our study reported an average of 519 Facebook friends (*Mdn* = 450; Range 0 - 2100).

### 2.2 Measures

**2.2.1 Facebook friend list and frequency of communication.** Participants were asked if they were Facebook friends with a person from ten different categories of relationships (close friend, friend, high school friend, high school acquaintance, friend of a friend, acquaintance, someone met only once, online friend, someone met while traveling, and stranger). If they answered affirmatively, they were asked how often they contacted this person via Facebook. There were seven possible responses of increasing frequency (1= *never* to 7= *every day*). The questionnaire is presented in Appendix A. We chose these categories based on previous studies conducted on college students' Facebook contacts [3,15]. We believe that it is important to take into account the types of relationships that may be found in a certain population when creating the list of relationships because they will most likely change based on the stage of life in which the participants are. For example, college students are unlikely to have grandchildren as a category of Facebook contacts, but older individuals might. Thus, while our measure is aimed specifically at measuring the *latent ties* of college students, it can also be adapted to other age groups by changing the types of relationships present in the list.

**2.2.2 Percent of latent ties.** The total percent of *latent ties* was calculated by counting the number of categories of relationships (max. 10) in participants' friend lists and the number of categories with whom participants never communicated (response *never* on the frequency of communication scale, highlighted in grey in Appendix A). The number of categories with whom they never communicated was divided by the total number of relationship categories in their friend list. The resulting value is the percent of *latent ties* that make up their Facebook network. For example if a participant had nine categories in their friend list, and reported

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never communicating with three categories, then 33% of their Facebook friends would be *latent ties* (Total percent *latent ties* = 3/9).

**2.2.3 Bridging social capital on Facebook.** This measure was adapted from a widely used measure of online bridging SC [17] containing 10 items ( $\alpha = .902$ ). The word “online” was changed to “on Facebook” to measure bridging SC specifically in this context. Responses are provided on a 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Some sample items are, “Interacting with people on Facebook makes me want to try new things” or “Interacting with people on Facebook, makes me feel connected to the bigger picture.” Responses on the 10 items were averaged to create a bridging SC score.

### 3 Results

#### 3.1 Prevalence of *latent ties* and their relationship with bridging social capital

On average 39.11% ( $SD = 27.73$ ) of participants’ Facebook networks were *latent ties*. In other words, nearly 40% of participants’ Facebook friends categories were made up of people with whom they never communicate on Facebook. A Pearson correlation was performed between the percent of *latent ties* in participants’ Facebook networks and their bridging SC. We found that *latent ties* were negatively associated with bridging SC,  $r(164) = -.323, p < .001$ . In other words, an increase in the percentage of *latent ties* in one’s Facebook network is associated with a decrease in one’s bridging SC on Facebook.

#### 3.2 Dissociating *latent ties* from Facebook network size

To verify that the percent of *latent ties* is not related to the total number of Facebook friends, a Pearson correlation was conducted on these variables. Due to the skewed (skew = 1.49) and kurtotic (kurtosis = 3.57) distribution of the number of Facebook friends, we used a square root transformation to adjust for the positive skew in this variable before conducting the analysis ( $M = 21.52, SD = 7.49$ ). The square root of the number of Facebook friends was normally distributed (skew = 0.30, kurtosis = 0.52). The percent of *latent ties* in one’s

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network and the square root of the number of Facebook friends were not correlated,  $r(162) = .057, p = .469$ . Additionally, we examined whether the square root of the number of Facebook friends was a better predictor of bridging SC than the percent of *latent ties* using a Pearson correlation. Number of Facebook friends and bridging SC were not correlated ( $r(163) = .097, p = .216$ ). These additional analyses show that it is more important to take into account the percent of *latent ties* in Facebook users' networks, rather than their total number of Facebook friends, when examining the relationship between Facebook use and bridging SC.

### 4 Discussion

#### 4.1 Prevalence of *latent ties* on Facebook

In the present study, we found that nearly 40% of participants' Facebook friends were *latent ties*. This finding is interesting considering that the site was developed to facilitate creating ties, but this design choice may be driving disconnection. Indeed, friending individuals is relatively easy and keeping people on one's friend list is easier than actively defriending them. Although some users may be aware of the problems of maintaining a large network, they may be hesitant to defriend contacts because defriending someone on Facebook may constitute more of a social risk than simply leaving them on one's friend list. For example, face-to-face arguments may occur after defriending someone on Facebook [37] because the person who was defriended can feel negative emotions and ruminate about the experience [38]. Furthermore, increasing values for fame may also motivate users to create expansive networks that see one's information but that one does not actively communicate with [8,9]. This type of usage may suggest that relationships online are becoming more performative. In fact, another study on Facebook use in college students found that imagined audience size was more beneficial for social support than actual friend count [3]. Thus keeping *latent ties* in one's network could serve to inflate one's sense of imagined audience



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and therefore perceived social connections. This could be further proof of the idea that we have become addicted to social responses online which are highly rewarding in the brain [39]. Thus users may have many motivations for keeping *latent ties* in their network.

### **4.2 Effect of *latent ties* on bridging social capital**

Interestingly, we found that *latent ties* were associated with a decrease in bridging SC, contrary to the assertions of some theorists that they could increase SC [25,26]. Facebook is an interesting case of a technological platform that allows for maintaining *latent ties*, because it provides contact with *latent ties* through passively viewing information posted by them. Bourdieu's theory [40] of social capital would suggest that this type of link between individuals could increase social capital because he views social capital as a type of address book that one can call upon in times of need. However, other social capital theorists, such as Putnam suggest that communication with one's ties is important for maintaining social capital. Our findings tend to support Putman's view that contacts need to be actively maintained in order to provide social capital [6] because in our study *latent ties* were in fact negatively correlated with social capital.

Our results are also consistent with findings showing that passive Facebook use (i.e. viewing the newsfeed) does not increase bridging SC [28]. In a similar vein, a study examining the relationship between SC and outgoing communication, directed to a specific person found that directed communication increased bridging SC and that the number of communication partners was the best predictor of bridging SC rather than total network size [24]. Thus, it seems that relationships, even those conducted via social media, must be actively maintained to be beneficial. In fact, having *latent ties* may even be counterproductive as suggested by the negative association we observed between *latent ties* and bridging SC, but this relationship needs to be examined further.

### **4.3 The importance of measuring *latent ties* on Facebook**

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It is somewhat surprising that the percentage of *latent ties* was not related to the number of Facebook friends that users reported in our study. This may be due to different patterns of Facebook use. For example, research has shown that certain users prefer passive use such as browsing their newsfeed while others prefer active use where communication is privileged [41]. Additionally, other researchers have shown using Usage and Gratifications theory [42], that a user's motivations for using Facebook can change their type of usage [43]. For example, Facebook users who are motivated by sharing information tend to use more public forms of communication while those who are motivated to use the site for social interaction use more private forms of communication [43]. Therefore, depending on the type of activities users engage in, they may be more or less likely to have *latent ties* in their network. Future studies could examine what types of Facebook use and user motivations are associated with *latent ties*. Additionally, we found that the total number of Facebook friends was not correlated with bridging SC, suggesting the importance of taking into account the types of ties users have when examining the influence of Facebook on SC.

### **4.4 Limitations**

The main limitation of the present study is that we had a small sample and used only one discriminant measure of validity. In the future, researchers should look at other measures of discriminant validity and other measures of social connectivity, such as bonding social capital, with a larger number of participants. Another limitation of our study is that we examined only the association between college students' latent ties on Facebook and bridging social capital. We decided to concentrate on a single social network and population in this first study on measuring *latent ties* in order to simplify their measurement, but we believe that our measure can be adapted to other age groups and other social networking sites as well. In order to adapt our measure other researchers would simply need to find what relationships are most prevalent in a certain age group and either add these to the current list or replace

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relationships that may not be applicable to their population of participants. Researchers can also adapt our measure to other social networks by changing the communication question to be applicable to other social media sites. For example if a researcher was interested in *latent ties* on Instagram, they might change the communication item to “How often do you like or comment on a photo posted by [*relationship type*] on Instagram?”

### **4.4 Conclusion**

As Facebook continues to be one of the most popular social networking sites in the world and seems to promote the collection of *latent ties*, it will be important for future research to better understand how these types of relationships may influence SC and overall well-being. This study was a first attempt to respond to some of these questions which have previously been overlooked in the literature. A better understanding of how *latent ties* influence Facebook users’ levels of SC can help us understand the potential benefits or risks of these types of ties across social media platforms and how they might be transformed into ties that could increase SC.

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