Facebook Use and Social Capital – A Longitudinal Study

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Abstract

How does the use of social networking sites (SNSs) affect social capital offline and online? The increasing popularity of SNSs such as Facebook (FB) implies a significant change in the way we interact with others. In an extensive longitudinal study (N = 311), carried out in Norway between 2008 - 2010, we examined the relationship between FB use and social capital, with a focus on interpersonal interaction, including face-to-face (F2F) interaction. Our findings suggest that overall FB use does not significantly affect offline capital, despite a significant increase in the use of FB from 2008 to 2010, after controlling for age, gender and education. However, different types of communication strategies on FB correlate with various kinds of F2F interaction. Importantly, FB users who focus on FB communication with their close friends, also interact more frequently with their close friends F2F, compared to those using FB to communicate with "online strangers". The results also indicate that FB has become an important tool for keeping in touch with family members and existing friends rather than forming new connections.

Introduction

Facebook (FB) is the world's largest social networking site (SNS), with more than 500 million users worldwide (Facebook Stats, 2011). The rapid adoption of SNSs, such as FB raises important questions about the impact SNSs have on the formation of social capital. Researchers have been debating whether SNSs are improving or harming our social relationships (Barkhuus and Tashior 2010; Ellison et al. 2007; Steinfield et al. 2008; Subrahmanyam et al. 2008).

While some recent studies have found that FB use supports bridging social capital (Ellison et al. 2007; Steinfield et al. 2008), the impact of FB use on F2F interaction with friends and family in particular has not yet been investigated. Another limitation of recent research is that little is known about how diverse age groups interact socially on SNSs. So far the empirical research on SNSs has focused primarily on teenagers (e.g.; Barkhuus and Tashior 2010; Ellison et al. 2007; Steinfield et al. 2008), or those in their twenties (e.g.; Subrahmanyam et al. 2008). Older adults have been found to have different kinds of usage patterns and expertise than younger adults on FB (Brandtzæg et al. 2010), and may also have different social needs. Also, with rare exceptions, most of the previous studies on the Internet and friendships, as well as on SNSs, are based on cross-sectional survey data, and thus are limited to one point in time. Thus the question arises: Does FB use, in different age groups, support offline contact over time, such as F2F interaction with family members and friends? Or, in others words, Does FB makes us more social?

Whether SNSs are increasing or decreasing, offline social interactions in our close relationships could have a substantial impact on society. The present paper provides insight into how people interact in FB and in F2F settings, and explores the relationship between these two social contexts. This helps to shed light on how SNS users handle the offline and online practices, and if online interaction displaces offline contact. We investigate this by tracking 311 FB users ranging from 15 to 75 years old over three annual waves (2008-2009-2010).

Social Capital: The Internet and SNSs

Social capital is difficult to define, because it is not just a single entity, and there is no single generally accepted definition or operationalization of social capital (Ellison et al. 2007). However, we are in this paper, defining social capital in line with what Barbieri (2000) labels 'network based social capital', which is understood as the number of connections individuals have, and how often the individuals are nurturing these connections. This concept includes family connections or what we will label as "family-based capital" (e.g., Coleman 1990). Our operationalization of social capital is the frequency of social interaction, and the size of the individual social networks, offline and online (e.g., Brandtzæg et al. 2010; Putnam, 2000). A specific contribution of this paper is that we also focus on F2F interaction among friends and family

members. In addition, we distinguish between different types of social capital - bonding and bridging capital. According to Ellison et al. (2007), bridging capital is associated with weak ties (acquaintances), and bonding capital with strong ties (family and close friends). However, it should be noted, that we only map the social network and the association between offline and online contact - not the consequences of social capital as a social resource or value.

Research Hypotheses

The majority of previous research has uncovered a positive correlation between electronic communication such as SNSs, and F2F interaction, as well as different types of social capital formation (e.g. Ellison et al., 2007). Based on this prior work we propose the following hypotheses:

Family-based capital, offline and online: New reports show that family members and older adults increasingly visit SNSs such as FB (Ellison et al. 2009; Facebook statistics 2011), which might make it easier for family members to stay connected online and offline:

• *H1a: The use of FB will be positively associated with users' F2F interaction with family.*

• *H1b: The use of FB will be positively associated with users' online FB interaction with family members.*

Prior research (e.g., Barkhuus and Tashiro 2010; Ellison et al. 2007) suggests that the Internet can enhance F2F interaction, and that FB is mainly a tool to keep up with existing offline relationships, rather than to initiate new online. Our next hypotheses are therefore:

• *H2a: The use of FB will be positively associated with an increase in users' F2F interaction with close friends.*

• *H2b: The use of FB will be positively associated with an increase in the number of users' close friends' offline.*

• *H2c: The use of FB will be positively associated with an increase in the number of users' close friends' online.*

Bridging capital, offline and online: Previous research shows that the use of SNSs and FB is positively associated with bridging social capital (Ellison et al. 2007; Steinfield 2008), therefore:

• *H3a: The use of FB will be positively associated with users' number of offline friends and acquaintances (bridging capital).*

• *H3b: The use of FB will be positively associated with the number of acquaintances (bridging capital), and the frequency of contact with acquaintances and "people you only have met online".*

Method

This research uses longitudinal data. The data was collected using an online questionnaire filled out by a sample of FB users from Norway aged 15 to 75 years, in 2008, 2009 and 2010. Descriptive statistics of the sample are shown in Table 1. Method description is fully presented in Brandtzæg and Lüders, 2008)

Year	**2008**	**2009**	**2010**
Sample size	*N* = 311	*N* = 311	*N*=311
Age			
15-30	32%	32%	32%
31-40	37%	37%	37%
41-49	19%	18%	17%
51-60	8%	8%	9%
61-75	5%	5%	6%
Gender			
Male	39%	39%	39%
Female	61%	61%	61%
Education			
Compulsory	4%	4%	4%
High school	29%	29%	29%
University	66%	66%	66%
Other	1%	1%	1%
Students	33%	32%	31%

Table 1. Sample characteristics (in %)

Measures

In addition to demographics (Table 1), the questionnaire included the following measures:

Offline interaction*:** We used two questions to measure the frequency of F2F interaction with 1) Family, and 2) Close friends using a 6-point response scale: 1-Never; 2-Rarely; 3-Several times a year; 4-Several times a month; 5-Several times a week; 6-Daily. ***Offline social networks*:** Two questions: (i) *How many close friends do you have?* Using a 7-point scale: 1 (None), 2 (1-2), 3 (3-5), 4 (6-8), 5 (9-11), 6 (12-15), 7 (More than 15). (ii) *In total, how many friends and acquaintance do you have?* Using a 10-point scale; 1 (Fewer than five), 2 (6-10), 3 (11-20), 4 (21-30), 5 (31-50), 6 (51-100), 7 (101- 200), 8 (201- 500), 9 (501 – 1000), 10 (More than 1000). ***Online- interaction on FB: We asked the following four questions: "With usage of FB, how often do you have contact with the following persons?" 1) Close friends, 2) Acquaintances, 3) Family members you do not live with, and 4) People you only have met online. We used the same 6-point scale as for offline interaction. ***Online-social networks on FB***: We asked questions about (1) the number of acquaintance's on FB (similar 10-point scale as offline), (2) the number of close friends on FB (similar 7-point scale as offline), and (3) the number of family members on FB (5-point scale). ***Overall use of FB***: "How often do you visit Facebook?" With answers ranging between: 1-Never or almost never, 2-Several times a month, 3- Several times a week, and 4-daily.

Analysis and results

We assess how FB usage influences social capital offline and online. We used Partial correlations (r) controlling for age, gender, and education. We did this in the three time periods, to study the developmental trends from 2008 to 2010. We also tested the statistical significance of the differences between the correlation coefficients over time, using the Fisher r-to-Z transformation.

Descriptive statistics for all our social capital measures are available in Table 2. An inspection of the mean scores does not show any essential changes among *offline variables* from 2008 to 2010.

	2008		2009		2010	
Offline variables	M	SD	M	SD	M	SD
F2F interaction with family	3.87	0.86	3.90	0.89	3.95	0.89
F2F interaction with close friends	4.65	0.95	4.62	0.94	4.58	0.94
Number of acquaintances	5.43	1.93	5.50	1.91	5.65	2.04
Number of close friends	3.50	1.37	3.56	1.20	3.67	1.36
Online variables						
FB-use frequency	3.28	0.81	3.51	0.73	3.67	0.62
Nr. of acquaintances on FB	5.65	2.09	6.51	1.80	7.11	1.49
Family friends on FB	2.29	0.79	2.76	0.96	3.04	1.02
Number of close friends on FB	3.45	1.52	3.70	1.52	3.89	1.54
Family interaction on FB	2.18	1.22	2.45	1.30	2.70	1.34
Interaction with acquaintances on FB	3.35	1.36	3.49	1.34	3.67	1.26
Interaction with close friends on FB	3.33	1.42	3.51	1.39	3.72	1.38
Interaction with "online strangers"	1.75	1.33	1.62	1.20	1.71	1.29

Table 2. Summary of Mean (M) and Standard Deviation (SD) for variables used in the study (*N*= 311).

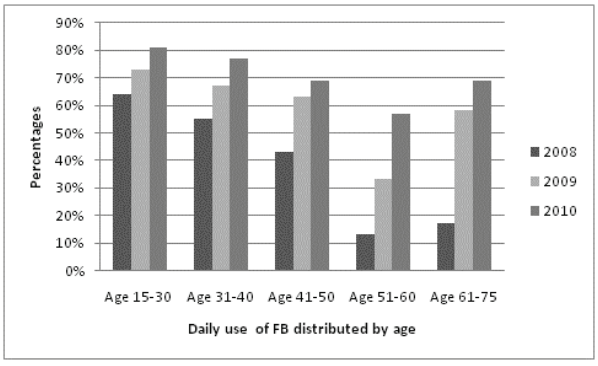

Figure 1. Daily FB users in the population in % by age (N = 311) from 2008 to 2009

Our numbers in Figure 1 suggest that FB, from 2008 to 2010, has become significantly more popular. In 2010, the majority, in all age groups use FB on a daily basis.

The correlation results are presented in Table 3. We also checked how the *correlation coefficients* were different from 2008 to 2010.

	Use of FB 2008	Use of FB 2009	Use of FB 2010
Offline variables			
F2F interaction with family	-.030	-.004	- .067
F2F interaction with close friends	+ .044	+.062	+ .101
Number of acquaintances	+ .118**	+. 064	+.045
Number of close friends	+ .070	+ .040	- .020
Online variables			
Number of acquaintances on FB	+.413**	+.352**	+.203**
Number of family friends on FB	+ .193**	+ .304**	+.157**
Number of close friends on FB	+.158**	+.223**	+.100
Family interaction on FB	+.274**	+.265**	+.229**
Interaction with acquaintances on FB	+.397**	+.351**	+.420**
Interaction with close friends on FB	+.215**	+.412**	+.397**
Interaction with "online strangers"	+.063	+.159**	+.097

Table 3. Partial correlations (*r*) between the overall use of FB with offline and online variables (2008-2009-2010), (N=311). Notes: Correlation is significant at the 0.05 level ** (2-tailed).

Family-Based Capital: H1a and H1b

H1a: Partly supported. No significant correlation between family interaction, and overall FB usage (see Table 3).

H1b: Supported. FB use is significantly and positively correlated with family interaction online in FB.

Bonding Capital: H2a, H2b and H2c

H2a: Partly supported. FB-use is positively associated with individuals' F2F interaction with friends over time, but not significantly (see Table 3). However, in Table 4, when we investigate the use of FB as a communication channel with friends, we see a significant positive correlation, however, the trend shows that this declined from 2008 to 2010, p = 0.403.

H2b: Not supported. We find no significant correlation between the use of FB and the number of close offline friends. The trend is somewhat negative from 2008 (r)-2010 (r), but not significant.

H2c: Supported. Online bonding capital in FB, among close friends, is positive and significantly (see Table 3).

	2008	2009	2010
F2F/offline variables	**Interaction with close friends on FB**		
F2F interaction family	+.070	+.093	-.044
F2F interaction with close friends	+.219**	+.142**	+.154**
	Family interaction on FB		
F2F interaction with family	+.150**	+.204**	+.135**
F2F interaction with close friends	+.029	-.011	+.067
	Interaction with "online strangers" on FB		
F2F interaction with family	-0.13	+.037	+.026
F2F interaction with close friends	-.063	+.008	+.033

Table 4. Partial correlations (*r*) between types of F2F interaction different communication strategies (2008-2009-2010), (N=311). Notes: Correlation is significant at the 0.05 level ** (2-tailed).

Bridging Capital: H3a and H3b

H3a: Not supported. There is a significant correlation between the use of FB and a wider circle of friends and acquaintances offline in 2008, but not in 2009 and 2010.

H3b: Supported. There is a significant correlation between the use of FB, and a having a wider circle of friends and acquaintances on FB, as well as a frequency of contact with them. However, this trend declined over the years (with a significant difference between the correlation coefficients in 2008 and 2010, $p = 0.003$). "Interaction with people I don't know" is not significant (except in 2009).

Discussion and conclusions

The results reveal a rapid growth of FB-usage from 2008 to 2010 among all age groups, which implies a substantial change to our traditional ways of interacting with others. FB has become commonplace and a well integrated communication tool to keep up with friends and family. Further, this study makes a number of contributions: First, we found that F2F interaction with close friends is positively related to FB communication with close friends in all three waves. In addition, we also found that FB communication with family members is associated with F2F communication with family members (see Table 4). This might imply that different communication behavior on FB supports certain kinds of F2F interaction. FB use can, therefore, have a reciprocal effect on F2F interaction with strong ties.

A second contribution is the identification of the increasing presence of family members on FB; both in terms of number of family members who are FB friends, and the frequency of interaction (see Table 3). A growing age diversity of the user population on SNSs (Ellison et al., 2009) explains the increasingly important role of FB in facilitating family interactions.

A third contribution of this study is that our findings, in general, contradict the assumption of the social displacement effect (e.g., Kraut et al. 1998), that time spent on social media will displace other and more apparent offline social activities such as F2F interaction.

Fourth, the findings support the bridging capital hypothesis online but not necessarily offline.

Finally, this study has limitations. The study was conducted in a specific SNS, namely FB, and in one country, Norway. While there is a strong rationale for these choices (FB is the largest SNS, and Norwegians are early adopters of technologies in general; SNSs in particular) studies of other SNS, possibly in other countries, could enhance the generalizability of our findings.

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