The effects of intensity of Facebook use on social capital and word-of-mouth

Abstract

Numerous observers have criticized Facebook and its capacity to generate benefits for both people and firms. This study examines how the intensity of Facebook use (IFU) influences both the creation and maintenance of social capital (SC), an important benefit for people, and word-of-mouth (WOM), an important benefit for firms. Using a sample of 546 Facebook users and PLS-SEM, results show a curvilinear relation (in the form of an inverted U) between IFU and bridging SC (i.e., the newest and weakest links). In contrast, a positive linear relation between IFU and bonding and maintenance SC is evident (i.e., the strongest links). Results also show that IFU has an important positive direct effect on WOM and a lower (but significant) indirect positive effect through SC.

Keywords: intensity of Facebook use; social capital; word of mouth; social networking services.

1. INTRODUCTION

Facebook is the social network service with the greatest number of users and the greatest investment in advertising in the world (Bonsón et al., 2017; Duffett, 2015). However, this popularity has led to numerous observers criticizing Facebook and its capacity to generate benefits for both individuals and firms alike (Bell, 2019).

The literature has shown how one of the main benefits of using Facebook for individuals is its capacity to generate social capital (SC) (Mariek et al., 2018). Liu et al. (2016) conducted a meta-analysis with 58 studies which evidenced that intensity of Facebook use (IFU) is positively related to bridging and bonding SC. Nevertheless, some studies suggest that excessive IFU may harm the creation and maintenance of SC (e.g., Bohn et al., 2014; Clayton et al., 2013; Tandoc et al., 2015). As a result, the relation between IFU and the creation and maintenance of SC might in fact be curvilinear (in the form of an inverted U). Unfortunately, most studies have, explicitly or implicitly, assumed a linear relation between IFU and the creation and maintenance of SC (e.g., Antheunis et

al., 2014; Brandtzæg, 2012; Ellison et al., 2007; 2014; Johnston et al., 2013; Liu et al., 2016; Mahmood et al., 2018). Previous studies have failed to assess the existence of a curvilinear relation between IFU and SC. It should be highlighted that a linear relation would entail consistent and constant IFU performance on SC, such that any increase in IFU has the same effect on SC. In contrast, were this effect in fact to be an inverted U-shaped curvilinear relation, an increase in IFU would not necessarily increase SC for the most intensive Facebook users but would, on the other hand, actually reduce it. As a result, the present work seeks to bridge this gap in the literature. To this end, this work tests linear and quadratic models which explore the relationship between IFU and SC.

Word of mouth (WOM) enables firms to promote their products and services effectively, rapidly and with little cost (Chu & Kim, 2018). Although the literature has analyzed WOM in social networks (e.g., Chu & Kim, 2011; Farías, 2017; Wang et al., 2016), there are no studies directly linking IFU and WOM, or the mediating role which SC might play in the relation between IFU and WOM. The present study also seeks to bridge these two gaps.

2. CONCEPTUAL FRAMEWORK

Figure 1 shows the conceptual framework. This section discusses the effects of IFU on SC and WOM.

<< Figure 1 here >>

2.1. The effect of IFU on SC

Conceptually, SC could be examined through three dimensions: bridging, bonding, and maintenance SC (Ellison et al., 2007). Bridging SC is related to ‘weak links’, which are fragile connections between individuals who might provide useful information or fresh perspectives, but who do not tend to provide emotional support. Bonding SC exists between individuals involved in very tight and emotionally close links, such as family and close friends. Maintenance SC refers to the ability to maintain valuable connections as one progresses through life’s changes, even after physically disconnecting from such links (e.g., from former schoolmates) (Ellison et al., 2007).

The interactions maintained by Facebook users can replace and/or complement personal interactions as well as break down geographical and social barriers (Casquero et al., 2016; Horrigan, 2002; Nadkarni & Hofmann, 2012; Parks & Floyd, 1996; Sabatini & Sarracino, 2017; Tidwell & Walther, 2002; Wellman et al., 2001). In this way, IFU can generate new links as well as strengthen existing ones (Burke et al., 2011; Donath & Boyd, 2004; Hampton & Wellman, 2003; Kavanaugh et al., 2005; Steinfield et al., 2008). Previous studies have shown that IFU is closely linked to the creation and maintenance of SC in such disperse countries as the United States (Ellison et al., 2007; 2014), Pakistan (Mahmood et al., 2018), Norway (Brandtzæg, 2012), South Africa (Johnston et al., 2013), and the Netherlands (Antheunis et al., 2014) among others. In fact, Liu et al. (2016) conducted a meta-analysis through 58 studies at a global scale and found a positive relation between IFU and bridging and bonding SC.

Nevertheless, some studies are suggesting that the relation between IFU and the creation and maintenance of SC might in fact be curvilinear, taking the form of an inverted U (e.g., Bohn et al., 2014; Clayton et al., 2013; Lampe et al., 2013; Tandoc et al., 2015; Youn et al., 2013). In this way, if quadratic terms had been omitted, non-linearity would not have been found in previous studies, even if it existed. As a result, examining a curvilinear relation between IFU and SC implies a contingent approach; in other words, increasing IFU might prove more effective at generating SC in certain circumstances (non-intensive Facebook users) than in others (intensive Facebook users).

Lampe et al. (2013) drew a distinction between non-users, moderate users and intensive users of Facebook in which those classed as moderate Facebook users displayed greater SC. Lampe et al. (2013) suggest that future works might explore the notion of a threshold effect, which would imply the existence of a level of IFU after which the positive effects of increasing IFU on SC are curbed.

In this study, we posit a relation in the form of an inverted U (concave) between IFU and bridging SC (i.e., the newest and weakest links). Increasing IFU might prove to be ineffective at enhancing bridging SC for intensive Facebook users for a number of reasons. Firstly, these users would feel stressed due to the high number of interactions, and would consequently fail to display any great enthusiasm towards engaging in a greater number of new links (Ayyagari et al., 2011; Bright et al., 2015; Gartner, 2011).

Secondly, Bohn et al. (2014) show that Facebook contacts react negatively to very high publication frequency in Facebook, hindering the creation of newer and weaker links (i.e., bridging SC) for more intensive Facebook users.

Third, certain studies conjecture that excessive use of social network services such as Facebook and mobile technologies might be contributing to increased solitude (Brandtzæg, 2012; Lou et al., 2012), perceptions of low satisfaction or wellbeing (Au et al., 2009; Chou & Edge 2012; Kalpidou et al., 2011), and depression (Brailovskaia & Margraf, 2017; Feinstein et al., 2013; Tandoc et al., 2015; Youn et al., 2013), thus encumbering the creation of bridging SC for the most intensive Facebook users.

Finally, excessive use of social network services is linked to compulsive use, which might trigger psychological and social complications in a person's life at school or at work (Kuss & Griffiths, 2011; Liu et al., 2017; Qiaolei, 2014). Rosen et al. (2013) point out that the negative effects of overuse of these services is related to a tendency towards aggressive and antisocial behavior. In addition, people tend to divide the world by classifying individuals as being either friends or detractors, with Facebook possibly leading to the creation of hate groups as can sometimes be seen in social network services (Johnston et al., 2013; Kokkinos et al., 2016), and which thereby thwarts the creation of bridging SC for intensive Facebook users.

Intense Facebook use might undermine the creation of new links, causing a reduction in bridging SC given the high levels of IFU. As a result:

Hypothesis 1a. The relationship between IFU and bridging SC follows an inverted U-shape.

The situation would be different when examining the relation of IFU with bonding and maintenance SC (i.e., the strongest links) for two reasons which might reverse or offset the negative effects of IFU for intensive Facebook users. Firstly, Facebook helps users to maintain their relations despite the difficulties involving geographical distance and busy lifestyles (Burke et al., 2010; DiMaggio et al., 2001; Horrigan, 2002; Johnston et al., 2013; Parks & Floyd, 1996; Sabatini & Sarracino, 2017; Tidwell & Walther, 2002; Wellman et al., 2001), for example by facilitating and speeding up the coordination and celebration of

group meetings (online and/or in person) and by maintaining contact through messages. As a result, intensive Facebook users might benefit from increasing their use of Facebook by replacing (almost as if they were there in person) and/or complementing their personal interactions in order to retain existing links (i.e., increasing bonding and maintenance SC) (Subrahmanyam et al., 2008).

Secondly, high levels of social network use imply greater vulnerability, which is related to solitude, slight depression and symptoms of stress (Brailovskaia & Margraf, 2017; Brandtzæg, 2012; Maier et al., 2012; Tandoc et al., 2015; Youn et al., 2013). People with high IFU might seek emotional support related to maintaining previously created relations, by expressing good wishes or through messages of encouragement in times of trouble (Burke & Kraut, 2013; Pera, 2018). As a result, in cases of high levels of Facebook use, users would focus their efforts on investing their time in keeping in touch with those with whom they have close ties, attaching greater importance to bonding and maintenance SC rather than concerning themselves with forging new links (i.e., bridging SC) (Luarn & Chiu, 2015). As a result:

Hypothesis 1b. The relationship between IFU and bonding SC is linear.
Hypothesis 1c. The relationship between IFU and maintenance SC is linear.

2.2. The effect of IFU on WOM

IFU might have a direct positive effect on WOM. Previous studies suggest that intensive Facebook users are more likely to self-reveal their social lives, likes and lifestyles (Vitak et al., 2011; Xenos et al., 2014; Wang, 2013). Moreover, with regard to the activities carried out in the network, Facebook users spend a considerable amount of time merely observing others (Clayton et al., 2013; Valenzuela et al., 2014). In fact, they devote more time to viewing content on the social network than to publishing on it (Pempek et al., 2009). These activities, such as reading other people's profile information and updates without actually interacting closely with them, might provide content for conversation and reveal similarities between users, thereby favoring WOM between them (Antheunis et al., 2015; Faraj et al., 2011). As a result, greater IFU might enhance Facebook user WOM.

In addition, IFU might exert an indirect positive effect on WOM through SC. Prior research has evidenced a positive effect of SC on WOM (Chu & Kim, 2011; Farías, 2017; Wang et al., 2016). As their use of Facebook increases, users create and maintain SC, thus enabling them to generate even more WOM. Therefore, greater use of Facebook increases SC (Liu et al., 2016) and, as a result, might also indirectly increase WOM. SC would act as a facilitating element for more intensive Facebook users to generate WOM. As a result:

Hypothesis 2. IFU exerts (a) a positive direct effect on WOM, and (b) a positive indirect effect on WOM through SC.

3. METHOD

In order to measure IFU and SC, the scales employed by Ellison et al. (2007) were used. In addition, we used the self-esteem and satisfaction with life scale applied by Ellison et al. (2007) as control variables since said authors observe that both variables explain a significant amount of the variance in the three dimensions of SC. In order to measure WOM, we used the Chu & Kim scale (2011).

The questionnaire was given to 546 Facebook users, who were postgraduate university students in Chile, a country which has a high Facebook penetration rate amongst the population (77.5%; *Internet World Stats*, 2019). All of the scales were translated into Spanish using a dual translation procedure, which has proven to be one of the most reliable methods for validating such a process (McGorry, 2000). Paper versions of the questionnaires were distributed amongst students for completion in private, and it was stressed that there were no right or wrong answers in an effort to encourage participants to give honest answers.

Partial least squares structural equation modeling (PLS-SEM), using SmartPLS 3, provided the technique for empirical assessment of the hypotheses. In order to obtain the significance levels, the bootstrapping option was run using 5,000 subsamples (Hair et al., 2016). Based on the indicator loadings (>0.70), 35 indicators were preserved across the seven latent constructs. Cronbach's α, the average variance extracted (AVE), and composite reliability serve to assess convergent validity (see Table 1). All constructs reach Cronbach α values above the required thresholds of 0.70 (Nunnally, 1978). Composite reliability

exceeds the required threshold of 0.70, and the AVE exceeds 0.50 for all the constructs (Hair et al., 2016). The heterotrait-monotrait (HTMT) criterion also demonstrated discriminant validity. All constructs exhibited ratios of less than 0.85 (Henseler et al., 2015). The construct relationships were next assessed by examining multicollinearity. Hair et al. (2016) recommend a variance inflation factor (VIF) below 5. Each construct's values were well below the critical levels. Table 2 contains the latent factor correlations.

<< Table 1 here >>

<< Table 2 here >>

4. RESULTS

4.1. The effect of IFU on SC

As can be seen in Table 3, the results from model 1 indicate that the control variables explain 36.8% of variance of bridging SC. Adding the linear term of IFU in model 2 increases the R^2 value by 2.2% and shows that IFU is positively related to bridging SC. Model 3 adds the quadratic term of IFU, which proved to have a negative and statistically significant effect on bridging SC, increasing R^2 by 0.7%, which suggests a curvilinear relation in the form of an inverted U (concave) between IFU and bridging SC. As a result, hypothesis H1a is supported.

The results from model 1 indicate that the control variables explain 20.3% of the variance of bonding SC. Adding the linear term of IFU in model 2 increases the R^2 value by 1.2% and shows that IFU is positively related to bonding SC. Model 3 adds the quadratic term of IFU, which proved to be non-significant statistically, suggesting a positive linear relation between IFU and bonding SC, and supporting hypothesis H1b.

The results in model 1 indicate that the control variables explain 8.9% of the variance of maintenance SC. When adding the linear term of IFU in model 2, no statistically significant effect of IFU on maintenance SC is observed. Nevertheless, a positive effect of IFU on maintenance SC does emerge when adding the quadratic term of IFU, which proved to be statistically non-significant, suggesting a positive linear relation between IFU and maintenance SC. Hypothesis H1c is therefore supported.

<< Table 3 here >>

4.2. The effect of IFU on WOM

Table 4 shows the results for the direct and indirect effects (via SC) of IFU on WOM. Results show that IFU has a significant direct positive effect 0.21 ($p < .01$) on WOM, thus supporting hypothesis H2a. In addition, it can be seen that IFU has a significant indirect positive effect (via SC) of 0.04 ($p < .01$) on WOM, thereby supporting hypothesis H2b. The indirect effect of IFU on WOM occurred via maintenance SC. This finding is consistent with prior research which evidences that the stronger the ties the greater the WOM (Chu & Kim, 2011; Farías, 2017). Nevertheless, it is interesting to note that the bulk of the effect of IFU on WOM is direct (0.21 de 0.25); in other words, it is not mediated by SC. This result suggests that the effect of IFU does not necessarily require an increase in SC in order to generate WOM.

<< Table 4 here >>

The overall predictive ability of model 3 is assessed using Q^2 blindfolding. Values greater than .02 show that the endogenous construct exhibits predictive relevance (Rigdon, 2014). Each construct's values were above the critical levels, with the lowest Q^2 being .07 (maintenance SC).

5. DISCUSSION

This study focuses on exploring how IFU impacts the formation and maintenance of SC and WOM. The work examines linear and quadratic models in order to explore the nature of the relation between IFU and the creation and maintenance of SC. Using a sample of 546 Facebook users and PLS-SEM, results reveal a curvilinear relation (in the form of an inverted U) between IFU and bridging SC. In contrast, a positive linear relation between IFU and bonding and maintenance SC emerges. The results also show that IFU has an important direct positive effect on WOM as well as a less pronounced (but still significant) indirect positive effect through SC.

5.1. Implications for policymakers and administrators

Different functional forms have different implications for policymakers and administrators (e.g., governments, schools, universities, and businesses). A linear relation implies constant performance, such that an increase in IFU has the same effect on SC. As a result, investing more time and energy in each level of IFU is equally important in terms of increasing SC. The results to emerge from this study show this to be true for bonding and maintenance SC. However, our findings reveal that in the case of bridging SC (i.e., the formation of new links), for intensive Facebook users it would not be suitable to increase IFU since it would diminish bridging SC. These results suggest that policymakers and administrators of social network services, firms, schools, and universities should set up environments (e.g. physical and/or virtual events through Facebook aimed at making new friendships) so that intensive Facebook users can forge fresh links (i.e., bridging SC).

The results also show that the more intensive Facebook users generate greater WOM. Consequently, business administrators might avail themselves of IFU as a segmentation variable, for example by selecting the most intensive Facebook users in order to promote the launch of new products and services, spread news, and so on, by constantly providing them with materials (e.g., discount coupons, videos, advergames) so that more intensive Facebook users may disseminate them. Likewise, firms should create greater value and better error recovery in the product/service with intensive Facebook clients so that this greater WOM which they generate is positive and not negative.

5.2. Implications for researchers

The findings to emerge from this research have important implications for researchers who are striving to explore the effects of IFU on SC and WOM. The results of this study suggest that researchers should include the non-linearity of the effect of IFU on SC and embrace IFU (and SC mediation) as an important antecedent of WOM.

Future research should again examine the relations put forward this work, using a more complex set of data, for example by incorporating longitudinal data and using observed measures rather than just self-reported ones. In addition, this article seeks to encourage similar research in other countries in an effort to confirm or challenge the findings presented herein. Moreover, possible differences between cultures make it vital to

carry out studies which measure, compare, and explore the different levels of IFU, SC and WOM that exist between cultures as well as their possible causes.

Furthermore, this study might be replicated with other social network services such as Twitter, Instagram, or LinkedIn, which would no doubt prove useful vis-à-vis examining to what extent the present findings might be generalized to other social network services.

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Figure 1. Proposed model

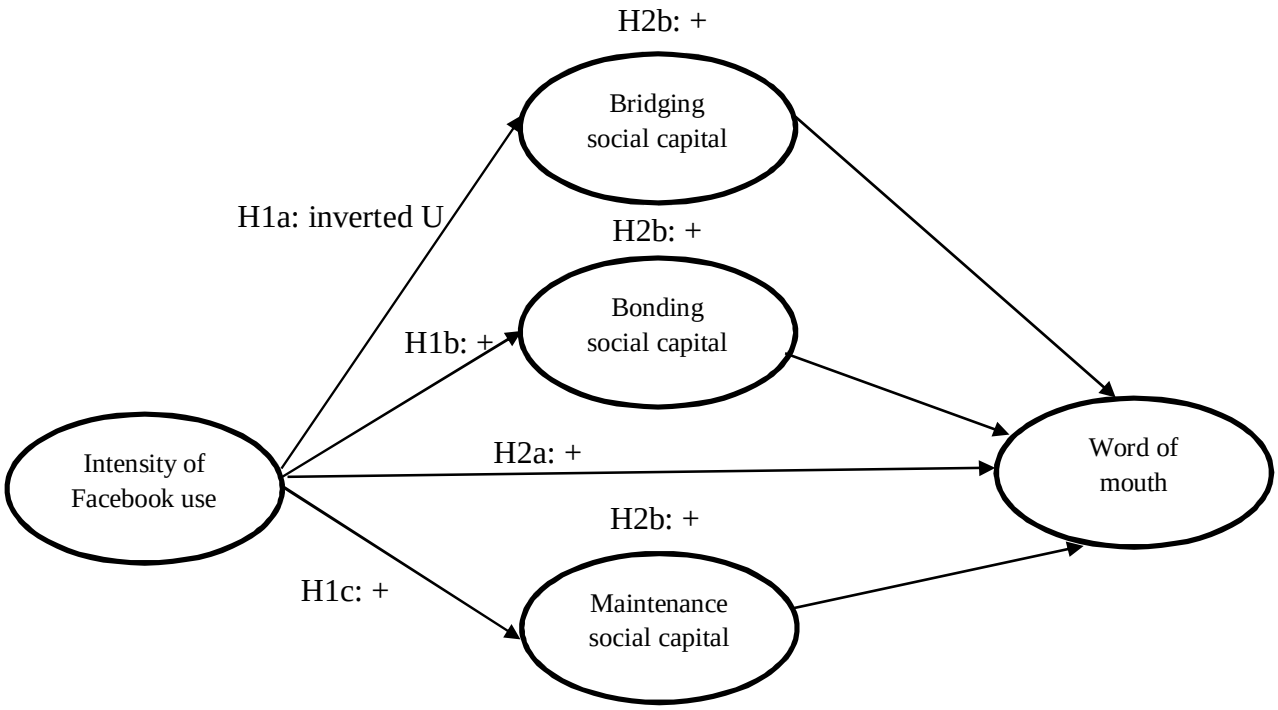

Table 1.

Reliability and validity of the constructs.

	Number of items	Cronbach alpha	Composite reliability	AVE	Maximum HTMT value
Word of mouth	5	0.869	0.905	0.657	0.328
Bridging social capital	8	0.877	0.902	0.537	0.667
Bonding social capital	4	0.754	0.844	0.576	0.645
Maintenance social capital	4	0.825	0.881	0.651	0.444
Intensity of Facebook use	5	0.764	0.841	0.517	0.325
Satisfaction with life	5	0.842	0.889	0.616	0.667
Self-esteem	4	0.719	0.825	0.541	0.409

Table 2.

Latent factor correlations.

	1	2	3	4	5	6	7
1.Word of mouth	1						
2.Bridging social capital	0.298	1					
3.Bonding social capital	0.237	0.528	1				
4.Maintenance social capital	0.253	0.228	0.349	1			
5.Intensity of Facebook use	0.270	0.246	0.163	0.053	1		
6.Satisfaction with life	0.267	0.600	0.407	0.204	0.143	1	
7.Self-esteem	0.200	0.241	0.311	0.270	0.007	0.317	1

Table 3.

Results.

Path coefficients	Bridging social capital	Bonding social capital	Maintenance social capital	Word of mouth
Model 1				
Bridging social capital				0.17*
Bonding social capital				0.03
Maintenance social capital				0.16**
Satisfaction with life	0.59**	0.34**	0.13*	0.10
Self-esteem	0.06	0.20**	0.23**	0.08
R^2	36.8%	20.3%	8.9%	14.1%
Adj. R^2	36.6%	20.0%	8.5%	13.3%
Model 2				
Bridging social capital				0.12
Bonding social capital				0.01
Maintenance social capital				0.17**
Satisfaction with life	0.56**	0.32**	0.13*	0.10
Self-esteem	0.06	0.21**	0.23**	0.09*
Intensity of Facebook use	0.17**	0.12*	0.03	0.21**
R^2	39.0%	21.5%	9.0%	18.3%
Adj. R^2	38.7%	21.1%	8.5%	17.4%
Model 3				
Bridging social capital				0.12
Bonding social capital				0.01
Maintenance social capital				0.16**
Satisfaction with life	0.55**	0.32**	0.13*	0.10
Self-esteem	0.07	0.21**	0.22**	0.09*
Intensity of Facebook use	0.11*	0.09*	0.13*	0.21**
Intensity of Facebook use^2	-0.08*	-0.04	0.20	
R^2	39.7%	21.7%	14.5%	18.3%
Adj. R^2	39.3%	21.2%	13.8%	17.3%

Note: *p < .05, **p < .01

Table 4.

Direct and indirect effects (via social capital) of Intensity of Facebook use on Word of mouth

Path coefficients	Model 2	Model 3
Direct effect		
Intensity of Facebook use (IFU) → Word of mouth (WOM)	0.21**	0.21**
Indirect effect		
IFU → Social capital (SC) → WOM	0.03	0.04**
IFU → Bridging SC → WOM	0.02	0.01
IFU → Bonding SC → WOM	0.00	0.00
IFU → Maintenance SC → WOM	0.01	0.02*
Total effect		
IFU → WOM	0.24**	0.25**

Note: *p < .05, **p < .01