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Exploring the effects of social capital on the compulsive use of online social networks in civil unrest contexts

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A B S T R A C T

The use of online social networking sites has become part of everyday life for more than three billion people worldwide. However, its use may go beyond being a habit, leading to compulsive use behaviours that jeopardize the well-being of an individual and the whole society. This study proposes and evaluates a theoretical model that examines the four dimensions of social capital, mediated by bonding and bridging social capital, as drivers of compulsive use of online social networks in the context of civil unrest. We evaluate the model using partial least squares structural equation modelling with data collected from a developing country. We found that reciprocity is the most important driver for bonding and bridging social capital with online members. Whereas trust, contradicting most of the literature in the field, was not statistically significant over bonding and bridging social capital. Bonding social capital shows a significant association with compulsive use behaviour. On the other hand, the effect of bridging social capital on compulsive use behaviour, although not significant, may become significant in the presence of a strong usage habit.

1. Introduction

Many of the members that belong to an individual's social network (offline) are also part of their online social networking sites (SNS) (e.g., Facebook, Instagram), meaning that these offline and online communities share some degree of connectedness. For instance, Ramadan (2017) showed evidence that the use of Facebook facilitated communication and collaboration between Syrian refugees; Kahne and Bowyer (2018) examined the interactions between offline political action and online participation in politics and how this interaction leads to political engagement. The quality and quantity of those social relationships, both offline and online, form the individual's social capital (Putnam, 1995).

SNS technologies can help to create, maintain, and enhance social relationships by facilitating interaction between members, thereby strengthening an individual's social capital (Lieberman and Schroeder, 2020; Ramadan, 2017). Nevertheless, the use of SNS may bring both positive and negative outcomes for its users. For instance, as positive features, online social capital may serve as a motivation for civic engagement and building trust among the members of civic groups and/or communities (Warren et al., 2014). On the other hand, an

excessive need for social interaction may lead users to addiction to SNS use, which may jeopardize the well-being of the individual (Hadlington and Scase, 2018; Turel and Osatuyi, 2017; Young et al., 2020), and, given the massive adoption of SNS, on the society as a whole (Cheikh-Ammar, 2020; Seo and Ray, 2019).

Under certain external circumstances to the SNS users, the habitual use of SNS and social media content generation may increase significantly. One such circumstance is a period of civil unrest resulting from economic or political reasons (BBC News, 2020; Mou et al., 2013). For instance, during the so called "Arab spring" in 2010 and 2011 (Bruns et al., 2013), Twitter and Facebook users generated a great deal of SNS activity. More recent events, such as the political protests in Latin-American countries at the end of 2019 (The Guardian News, 2019), the extensive protests against racism in the United States in 2020 (BBC News, 2020; Karduni and Sauda, 2020), and the news related to the COVID-19 pandemic crisis during lockdown (Kaya, 2020), were followed on the SNS by millions of users around the world.

Even though we may expect that under unrest events, global crisis, and curfews users may pay more attention to SNS channels to be informed, the existing body of knowledge is inconclusive about whether

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the context of SNS usage may lead to compulsive SNS use behaviour (Charlton and Danforth, 2007; Li et al., 2017; van den Eijnden et al., 2016).

The association between the social capital of an individual and compulsive SNS use behaviour has barely been addressed in the literature (Phua et al., 2017). This study contributes to knowledge in this area by exploring the effects of social capital mediated by bridging and bonding over the compulsive usage behaviour of SNS in the context of civil unrest. Bonding social capital is exclusive, it occurs between strongly tied individuals, usually with little diversity in their backgrounds, but with strong emotional support to each other. While bridging social capital is inclusive and happens amongst individuals creating connections in social networks from different backgrounds with weak emotional ties (Putnam, 2000; Williams, 2006).

Specifically, we evaluate the moderating effects of habitual use behaviour over the relationships of bonding and bridging with the SNS compulsive use behaviour. Data are collected from the context of political protests in Ecuador (BBC News, 2019) to evaluate our model. In addition, we analyse the potential non-linear effects between the bonding and bridging social capital with the SNS compulsive usage behaviour.

We continue with a brief review of social capital dimensions and types and their potential relationship with compulsive usage of SNS. Then we present the methods and the results of the evaluation of the structural model to clarify the relationship between bonding and bridging social capital to explain SNS compulsive usage behaviour. This is followed by a discussion of the results and final conclusions.

2. Literature review and hypothesis building

2.1. Civil unrest and SNS in Latin America

Protests, strikes, and demonstrations are considered civil unrest events. They can be as small as a nonviolent protest or as big as large-scale riots. During those periods, the SNS users may become more active and generate a substantial amount of engaging content about and related to the ongoing unrest events (Silva and Panahi, 2017). Therefore, the excess of SNS activity in the context of civil unrest deserves a closer examination as it may put the users' well-being at risk (Turel and Osatuyi, 2017).

Literature relates civil unrest with SNS in a way that makes it possible to forecast future events. For instance, Korkmaz et al. (2016) built a model to predict civil unrest based on SNS data, political events databases, and news sites information about six countries in Latin America (Argentina, Brazil, Colombia, Mexico, Paraguay, and Venezuela) from 2012 to 2014. They conclude that social media and news are the best sources of information to predict civil unrest events.

The Inter-American Development Bank (2020) identifies inequality and fractured societies as the main reasons for protests in a few major cities in Latin American countries in recent years: Chile, Colombia, and Ecuador. During protests, people with similar socioeconomic backgrounds may be closely linked by SNS and willing to communicate among themselves.

According to the Freedom House (2022) Ecuador was considered "partly free" regarding its internet freedom in 2020, with a score of 57/100. During mass protests the state-owned telecommunications corporation (CNT) suffered disruptions of its network service and image servers, providing no access to SNS such as Facebook and WhatsApp for fixed connectivity users. Moreover, "the government initiated several takedown request[s] and account suspension[s] against digital outlets" (Freedom House, 2022), claiming copyright infringement.

2.2. Social capital theory and its dimensions

Social capital is defined as "*the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit*" (Nahapiet and Ghoshal,

1998). Likewise, social capital literature also suggests that individuals perceive their networks as potential resources and opportunities for their own benefit (Coleman, 1988). Social capital can be explained by structural, relational, and cognitive dimensions (Bolino et al., 2002; Chang and Chuang, 2011; Chiu et al., 2006), and is manifested in both offline and/or online environments (Williams, 2006).

The rise of Information Technology in society has provided new forms of interaction among individuals and thus alternative forms to create, increase, decrease, and preserve social capital. Due to the alternative ways of communicating and sharing information, technology facilitates online linkages with others, and can increase users' bridging and bonding social capital by easily and inexpensively connecting people in social networks (Heidari et al., 2020). Moreover, Information Technology has created new channels for researchers to widely investigate social capital dimensions and characteristics. For example, Chiu et al. (2006) extended Nahapiet and Ghoshal's (1998) social capital conceptualization to study its dimensions in the context of virtual communities. More recently, researchers have investigated the role of new platforms such as massive, multiplayer, online role-playing games in building social capital (Hsu and Chang, 2022); how social capital mediates political engagement in social media platforms (Guo and Chen, 2022); and the role of conversational artificial intelligence in social capital (Ng, 2022).

Users' behaviour with different types of information technology that mediates the interaction of members of an online community can be explained using social capital theory. For instance, Chiu et al. (2006) and Chang and Chuang (2011) found a positive association between the effects of the social capital dimensions and the knowledge sharing behaviour in virtual communities. Naranjo-Zolotov et al. (2019) examined the effects of social capital dimensions over the intention to use e-government for citizen online participation. Contrary to their expectations, they found that neither reciprocity nor trust has a significant effect over intention to use.

In the context of SNS, social capital theory has been used to examine different phenomena. For instance, Jin (2015) suggests that the SNS users' self-assertion, social presence, self-efficacy, and self-esteem play an important role in the formation of bonding and bridging social capital. Phua et al. (2017) applied the theory of uses and gratification (Katz et al., 1973) to investigate how the use of different online SNS applications contributes to bonding and bridging social capital. Their study found that different SNS have different degrees of bonding and bridging social capital. For example, Twitter users reported the highest bridging social capital, whereas Snapchat users showed the highest bonding social capital. Ellison, Steinfield and Lampe (2007) found a strong relationship between the use of SNS and the formation and maintenance of social capital amongst college students. Similarly, Ahn (2012) suggest that teenagers who use SNS have higher levels of social capital in both online SNS and school (offline). Horng and Wu (2020) examined online social capital in the context of social commerce and found that a bonding and bridging partially mediates the relationship between SNS behaviour and social commerce intention.

The results of the studies mentioned above provide evidence that there is a positive relationship between SNS use and social capital. However, to the best of our knowledge, no study has yet investigated the association that may exist between the social capital dimensions and the excessive or compulsive use of SNS. We fill this gap by exploring the effects of social capital on problematic use of SNS.

2.2.1. Social capital structural dimension: interaction

The structural dimension describes the patterns of relationships and social interactions between members of an organization, or a community (Bolino et al., 2002; Chang and Chuang, 2011; Nahapiet and Ghoshal, 1998). In the present study we refer to the social interaction between the members of SNS. The quality and strength of social interaction is a key factor for the degree of knowledge sharing in virtual communities; the stronger is the social interaction, the higher is the frequency and intensity of the knowledge sharing (Chang and Chuang, 2011; Chen et al., 2021).

On the other hand, the expectations and the place-based context in which the social interaction occurs may limit the opportunities of developing social capital (Lager et al., 2015).

Previous studies explored the role of social interaction over SNS. For instance, in a meta-analysis study Skoric et al. (2016) found that the interaction on SNS has a positive association with citizen engagement, including political participation and civic engagement – both highly important factors in periods of civil unrest. In the same line, Shah et al. (2019) suggest that SNS are used as sources for sharing and seeking information and social support during crisis, thereby boosting civic engagement.

Huang et al. (2019) investigated members' satisfaction with SNS from an identity perspective and found that bridging social capital had a strong effect over user satisfaction, and that risk aversion to interacting with strangers over SNS had a non-significant effect over user satisfaction. these findings imply that SNS facilitates members' social interaction to bridge social capital. During periods of civil unrest, and when motivated by sensitive information and strong opinions generated on SNS, the increase in social interaction amongst individuals of social networks may also lead to an increase in bonding and bridging social capital. Consequently, we hypothesize:

H1.   Social interaction among the members of a SNS has a positive effect on bonding social capital.

H2.   Social interaction among the members of a SNS has a positive effect on bridging social capital.

2.2.2. Social capital relational dimensions: reciprocity and trust

The relational dimensions of social capital refer to the values present in personal relationships such as reciprocity, friendship, and trust developed by individuals with each other (Chang and Chuang, 2011; Nahapiet and Ghoshal, 1998). This perspective focuses on the links built on top of these connections based on individuals' norms, preferences, and attitudes (Coleman, 1988; Westlund, 2006). In the context of this study the relational dimension is measured as the perceptions of reciprocity and trust amongst members of the SNS.

Reciprocity is defined as the feeling of supportiveness between the members of a social network or community (Wellman and Gulia, 1999), and is a key factor in strengthening social capital on SNS. For instance (Chiu et al., 2006), suggest that reciprocity is a motivator for knowledge sharing behaviour in virtual communities. Shah et al. (2019) found evidence that the perceived social support plays an important role in public engagement during crises, meaning that individuals who receive supportive comments and/or likes on their Facebook posts may have the perception of reciprocity from their SNS members. Wang, Mcnally and Lenihan (2018) found that norms of reciprocity increase, and trust decreases, social decision-making constraints at individual and firm levels. Jia, Hall, Yan, Liu and Byrd (2018) examined the effect of reciprocity and trust on knowledge sharing and IT service quality, which in turn have a positive effect on job satisfaction.

Gil de Zúñiga et al. (2012) argue that reciprocity on SNS can facilitate civic and political engagement. In the context of civil unrest, SNS users may feel more pressure to provide informational support and express their opinions or support the opinions of others due to social norms of reciprocity, thereby enhancing bonding and bridging social capital. Thus, we hypothesize:

H3.   The extent to which there is a feeling of reciprocity between the members of a SNS positively impacts the bonding social capital.

H4.   The extent to which there is a feeling of reciprocity between the members of a SNS positively impacts the bridging social capital.

Trust is a critical element for creating a good atmosphere for social interaction (Chang and Chuang, 2011) and self-disclosure amongst the members of a SNS (Krasnova et al., 2010). It allows members of a networks to perform tasks that are more complex and more collaborative (Burt, 2005; Moran, 2005). Previous studies suggest that trust is directly

related to the quality of social capital in diverse contexts (Ahn, 2012). For instance, in the business context Lukiyanto and Wijayaningtyas (2020) found that trust is a critical factor of social capital for overcoming capital difficulties of micro and small enterprises. Pratono (2018) shows evidence that firms need to build trust upon SNS to improve pricing and selling capability. Similarly, in the context of crises, Shah et al. (2019) suggest that information that is shared by friends on SNS is perceived as trustworthy.

According to Gil de Zúñiga et al. (2012), the information that SNS users are exposed to is, to some extent, filtered by whom those users trust. The discussion of what happens in the community with other members promotes citizen engagement in civic participation and may shape the political views of SNS users, thus strengthening bonding and bridging. As the bonding social capital differs from the bridging social capital mainly in the strength of ties between its members (Leonard, 2004; Putnam, 2000), the levels of trust may have a greater impact among members with stronger ties and common values than among members with weak ties and heterogenous backgrounds. Consequently, we hypothesize:

H5.   The degree of trust amongst the members of a SNS has a positive effect on bonding social capital.

H6.   The degree of trust amongst the members of a SNS has no significant effect on bridging social capital.

2.2.3. Social capital cognitive dimension: shared values

The cognitive dimension of social capital is the degree to which members of a SNS have similar narratives, goals, viewpoints, or opinions, also known as shared values (Chow and Chan, 2008; Lin and Lu, 2011; Nahapiet and Ghoshal, 1998). Tsai and Ghoshal (1998) suggested that the shared values act as a bonding for sharing resources between members of a social network. In the context of civil unrest, the extent to which the members of the SNS share strong or even radical viewpoints may enhance bonding social capital. On the contrary, as bridging social capital does not represent strong ties between SNS members, we do not expect shared values to have a significant effect on members with weak ties. Therefore, we hypothesize:

H7.   Shared values among members of a SNS have a positive effect on bonding social capital.

H8.   Shared values among members of a SNS have no significant effect on bridging social capital.

2.3. Bonding and bridging social capital

Bonding and bridging social capital mainly refer to the strength of affective ties that individuals maintain among themselves in the SNS (Phua and Jin, 2011; Williams, 2006). Bonding social capital (strong ties) is common in closed and homogeneous communities based on networks of trust that can provide emotional support (Leonard, 2004; Lewicka, 2011; Mihaylov and Perkins, 2013). Bridging social capital (weak ties) associates individuals from different backgrounds and facilitates them to find new opportunities for sharing information and resources (Phua and Jin, 2011; Williams, 2006) and positively influences the satisfaction with a social network community (Huang et al., 2019). Both types of social capital are interrelated and can mutually exist (Ryan et al., 2008). Although some studies have also considered *linking* social capital as another type of social capital that focuses on the individual's interaction across institutionalized power or authorities (Szreter and Woolcock, 2004), our research concentrates on the formal and informal groups of individuals described by bonding and bridging social capital conceptualizations.

Both bonding and bridging social capital may bring positive outcomes for the members of a network, including greater self-esteem or life satisfaction (Phua and Jin, 2011; Phua et al., 2017), which might increase one's willingness to participate in online public forums and/or engage in civic activities (Acedo et al., 2019; Naranjo-Zolotov et al.,

2019). Bonding social capital provides social support, and reciprocity (Williams, 2006), and it is strongly related to collective efficacy (Collins et al., 2014) and well-being (Zhang, 2022). Bridging social capital links unrelated actors (Ahn, 2012; Baird and Gray, 2014) and encourages people to leave their social comfort zone to be part of a broader scene.

Currently, the massive adoption of SNS has allowed individuals to increase and maintain their actual social networks. For example, Hampton et al. (2011) found that the use of online social media and mobile phones is positively associated with the network size and diversity. Foster, Pitner, Freedman, Bell and Shaw (2015) state that bonding social capital can be related to a specific community, while bridging social capital recognizes social relations outside the community. In turn, Phua et al. (2017) found that the use of different SNS technologies may be related to different levels of bonding and bridging between members of those SNS. Even though bonding and bridging social capital have already been studied in the context of SNS (Horng and Wu, 2020; Phua and Jin, 2011; Phua et al., 2017), their potential association with compulsive use of SNS has received less attention in the literature.

As bonding and bridging social capital are related to the strength of affective ties and the emotional support that members of a SNS can obtain from each other, we assume that in the context of civil unrest bonding social capital will influence the members of a SNS to seek the support of others (family or friends) to bolster their views and opinions. Likewise, bridging social capital will motivate the members of a SNS to look for connections with others having different backgrounds, but with similar political views and ideologies. Therefore, we explore whether higher levels of bonding and bridging social capital contribute to the conditions that motivate higher frequency of SNS use, and consequently increase the likelihood of developing compulsive use behaviour of SNS under civil unrest conditions. We therefore hypothesize:

H9. Bonding social capital is positively related to compulsive usage of SNS.

H10. Bridging social capital is positively related to compulsive usage of SNS.

2.4. Habit

The popularity of SNS technologies has evolved to the point of becoming part of everyday life for almost three billion people around the world (Statista, 2020). A study from the Pew Research Center (2019) reports that nearly 80% of Facebook users in the United States use the SNS on a daily basis. This frequency of use suggests that the SNS usage can be considered a habit for most SNS users, i.e., the SNS usage behaviour becomes automatic over time (Soror et al., 2022). Furthermore, previous studies found that the relationship between habit and usage behaviour is actually strong ($\beta > 0.5$) (Hu et al., 2018). Even though the habit itself may not jeopardize the well-being of the users, habit may be a precondition for the development of compulsive usage behaviour if the circumstances of usage change for the individual (Turel and Serenko, 2012). Consequently, we hypothesize:

H11. Habit of SNS usage is positively associated with compulsive usage of SNS.

Previous studies demonstrate that habit has a positive impact on SNS usage behaviour (Hu et al., 2018; Turel and Serenko, 2012). However, in the context of civil unrest members of a SNS may feel a stronger need for reinforcing bonding and bridging social capital connections. In turn, this need may increase the frequency of SNS use, leading to potential SNS compulsive usage behaviour. Given the automatic-behaviour nature of habit, we expect that the habitual usage behaviour of SNS could moderate the effects of bonding and bridging social capital over the SNS compulsive usage behaviour. Therefore, we hypothesize:

H12. Habit moderates the relationship between bonding social capital and the compulsive usage of SNS.

H13. Habit moderates the relationship between bridging social capital and the compulsive usage of SNS.

The theoretical constructs and the relationships between them are depicted in Figure 1. In summary, our research model examines the association of social capital dimensions over the SNS member's ties to explain the compulsive SNS usage behaviour, and whether this relationship is mediated by the habitual usage.

3. Context and data collection

During the last months of 2019 several countries in Latin-America were the scene of massive and violent demonstrations in the streets. One of those countries is Ecuador, where the data were collected. The civil unrest events included violent clashes of civilians with police and the adoption of severe policies to control some large-scale demonstrations that included curfews and the deployment of the army on the streets. Normal daily life in some cities was strongly disrupted for a several weeks because of the chaotic situation, leading to interruption of
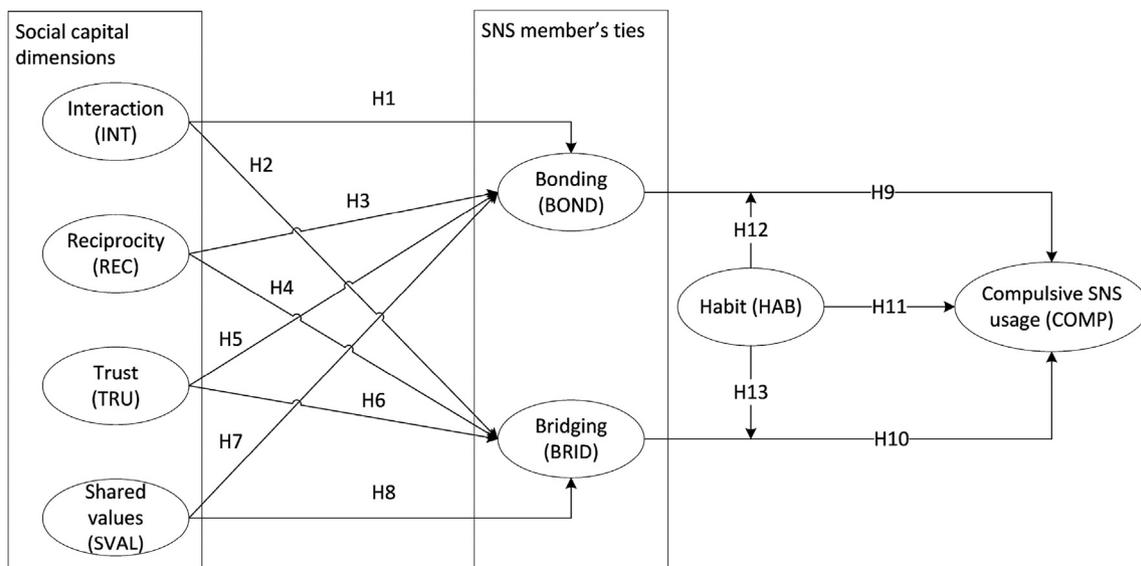
Figure 1. Research model.

business activities, temporary closure of universities, schools, public offices, transportation systems, and stores. All of these events generated a scenario of thousands of users creating highly engaging content on the SNS, ranging from political persuasion (Gil De Zúñiga, Barnidge and Diehl, 2018) to fake news about the protests, as well as posting real-time videos from the demonstration locations.

The study uses a convenience sample. We collected the data from Facebook users who reside in an Ecuadorian city that was the most affected by the demonstrations, meaning that the daily lives of targeted users were, directly or indirectly, disrupted by the events of civil unrest. We used an electronic questionnaire that was distributed using two channels: (i) by email to university students at a major Ecuadorian university and, (ii) on the SNS using the snowball sampling method (Baltar and Brunet, 2012).

According to the regulations of the Ethics Committee of NOVA IMS, this study complies with the requirements of the of the NOVA IMS Internal Review Board. The first part of the questionnaire had an introduction explaining the purpose of the study, the context of civil unrest, and the ethical aspects. Participants were informed about the anonymity of the data collected and that these data would be used for scientific research only. They were also informed that they could abandon the questionnaire at any time, asking consent in order to continue with the questionnaire. The second part of the questionnaire contained the items from the constructs of our research model. The questions were first written in English and then translated into Spanish – the native language of Ecuador. Table 1 shows the constructs and items used in the questionnaire.

Our study collected a total of 237 valid answers. Of the respondents, 162 (68.4%) were males. Regarding the education level, 29 (12.2%) reported having secondary education, 155 (65.4%) higher education (undergraduate), and 53 (22.4%) graduate studies, either master's degree or PhD. Regarding age, 111 (46.8%) were 25 years old or younger, 82 (34.6%) were 26–40 years old, and 44 (18.6%) were 41 years or older.

The rule of thumb suggested by J. Hair, Hult, Ringle and Sarstedt (2017) is that the number of observations is at least ten times the maximum number of paths directed to a construct. Furthermore, Reinartz et al. (2009) suggests that is possible to achieve acceptable statistical power in models evaluated using PLS with a sample as low as 100 observations. Hence, our sample size is adequate to assess the model using the PLS-SEM method.

4. Results

4.1. Measurement model quality assessment

This study uses partial least squares structural equation modelling (PLS-SEM) to evaluate the research model. This technique is appropriate for research models with small to medium sample sizes and in which the goal is to identify key driver constructs. PLS-SEM is preferable to covariance-base methods (CB-SEM), as the first PLS is more appropriate for assessing exploratory models and CB for theory confirmation (Hair et al., 2017). Our research model is considered exploratory. PLS-SEM has been widely used in diverse research fields including e-government (Naranjo-Zolotov et al., 2019), the use of mobile apps (Tam et al., 2018), and recycling behaviour (Aboelmaged, 2021).

The software used to evaluate the research model was SmartPLS 3.0 (Ringle et al., 2015). All the constructs in our model use reflective indicators. We first test for common method bias using the criterion of variance inflation factor (VIF) at construct level, that suggest that VIFs values should be lower than 3.3 (Kock, 2017). The highest VIF value in our model is 2.9, consequently, our model is considered free of common method bias.

The quality of our measurement model was assessed following the approach proposed by Hair et al. (2017). We assess the internal consistency, the discriminant validity, and the construct reliability. The Cronbach's alpha (CA) and composite reliability (CR) exceeded the threshold

Table 1. Measurement instrument.

Construct (Abbreviation)	Items	Source
Habit (HAB)	It is a habit of mine to use social media.	(Hu et al., 2018)
	Using the social media has become automatic to me.	
	Using the social media is natural to me.	
Compulsive usage of SNS (COMP)	My social life has suffered because of me interacting with social media.	(Charlton and Danforth, 2007)
	Using social media interfered with other activities.	
	When I did not use social media, I often felt agitated.	
	I have made unsuccessful attempts to reduce the time I interact with social media.	
Interaction (INT)	I maintain close social relationships with some members in the social media.	(Chang and Chuang, 2011)
	I spend a lot of time interacting with some members in the social media.	
	I have frequent communication with some members in the social media.	
	I know some members in the social media personally.	
Trust (TRU)	Members in my social media will not take advantage of others even when the opportunity arises.	
	Members in my social media behave in a consistent manner.	
	Members in my social media are truthful in dealing with one another.	
Reciprocity (REC)	It is fair to help each other in my social media.	
	I know that other members in my social media will help me, hence it's fair to help other members.	
	I believe that members in my social media would help me if I needed it.	
Shared values (SVAL)	I think that my social media provide information that reflects my values.	(Lin and Lu, 2011)
	I agree with what my social media consider to be important.	
	My social media activities are in line with my personal values.	
Social bonding (BOND)	I had the chance to know people who belong to an organization I also belong to through social media.	(Jin, 2015)
	I had the chance to know people who live in the same community through social media.	
	I had the chance to know people who have the same beliefs or common interests through social media.	
Social bridging (BRID)	I had the chance to know people who live in areas distant from mine using social media.	(Jin, 2015)
	I had the chance to know people from a different socio-economic background using social media.	
	I had the chance to know people from different communities using social media.	Self-developed

of 0.7, showing a good internal consistency. Convergent validity is assessed by the average variance extracted (AVE) and the outer loadings. All AVE scores and the items' loadings are above the threshold of 0.5 and 0.7, respectively. Table 2 presents the quality assessment values.

The discriminant validity demonstrates that the theoretical concepts that are not supposed to be related to each other, are indeed not related (Henseler et al., 2015). It is assessed by two criteria, (i) the Fornell-Larcker criterion, which states that the square root of AVE should be greater than its correlation with any other construct (Fornell and Larcker, 1981) (see Table 3), and (ii) the Heterotrait-Monotrait ratio of correlations (HTMT) (Henseler et al., 2015), in which a value below 0.9 suggest good discriminant validity (see Table 4).

4.2. Structural model

The structural model was estimated using the bootstrapping technique with 5000 iterations. The structural model yields the levels of significance of the path coefficients using the p-value criterion. The level of significance indicates the rejection or acceptance of our hypotheses. Seven hypotheses were supported (H3, H4, H6, H7, H9, H11, and H13) and six were rejected (H1, H2, H5, H8, H10, and H12). It should be noted that H6 was originally hypothesized as not significant, which was confirmed.

The coefficient of determination (R^2) yields the predictive power of our model. The model explains 31.6 % of the compulsive SNS usage and 26.2% of the bonding social capital, which may be described as having moderate-to-weak predictive power (Henseler et al., 2009).

We also assessed the quadratic effects of the bonding, bridging, and habit over the compulsive SNS usage. Bridging and habit had non-significant quadratic effects over compulsive usage. Only bonding yielded a statistically significant, although negative, quadratic effect over the

compulsive usage of SNS (-0.203). As advised by Hair et al. (2018), the statistical significance of the quadratic effect does not imply relevance. Consequently, we assessed the strength of the quadratic effect by means of f square (f^2), which tells us how much the quadratic effect of bonding contributes to explaining the endogenous latent variable. An effect size of $f^2 = 0.033$ is considered a small effect size. Figure 2 depicts the resulting values of the path coefficients.

Bonding and bridging are evaluated as mediators between social capital dimensions and the compulsive SNS usage. Mediation occurs when a third variable intervenes between other two variables, where a change in the exogenous variable causes a change in the mediator, which in turn, causes a change in the third variable (Hair et al., 2017, p. 228). We test for the indirect effects of social capital dimensions on compulsive SNS usage. Results show that only shared values and reciprocity have a statistically significant effect on compulsive SNS usage that is mediated by bonding. Please see Table 5.

5. Discussion

Nowadays, SNS are widely and increasingly used during civil unrest periods, not only by people who want to share their political views or learn about the opinion of others, but also by people who are directly participating in those events. They are using SNS to communicate amongst themselves to coordinate the protests and demonstrations (Freedom House, 2022). The results of this study provide evidence that not all dimensions of social capital (interaction, reciprocity, trust, and shared values) have a statistically significant effect over bonding and bridging social capital. Interaction amongst SNS members was significant over bonding but not over bridging, i.e., the interaction over the social media is greater among the members that have stronger emotional connections than among the members with weaker emotional ties. This

Table 2. Construct reliability and validity.

| Construct	Item	Mean	Standard Deviation	Loading	CA	CR	AVE
COMP	COMP1	2.278	1.539	0.827	0.851	0.900	0.692
	COMP2	2.595	1.614	0.869			
	COMP3	2.363	1.563	0.848			
	COMP4	2.682	1.661	0.780			
BOND	BOND1	2.725	1.758	0.906	0.889	0.931	0.819
	BOND2	2.992	1.826	0.916			
	BOND3	3.333	1.854	0.892			
BRID	BRID1	3.376	1.878	0.930	0.935	0.959	0.886
	BRID2	3.356	1.957	0.938			
	BRID3	3.363	1.895	0.956			
HAB	HAB1	4.35	1.795	0.922	0.935	0.958	0.885
	HAB2	4.135	1.839	0.958			
	HAB3	4.274	1.904	0.942			
INT	INT1	4.346	1.793	0.845	0.882	0.918	0.738
	INT2	3.43	1.671	0.870			
	INT3	3.797	1.731	0.912			
	INT4	4.814	1.837	0.804			
REC	REC1	4.612	1.77	0.879	0.889	0.931	0.819
	REC2	4.308	1.699	0.938			
	REC3	4.076	1.702	0.897			
SVAL	SVAL1	3.565	1.543	0.892	0.803	0.885	0.720
	SVAL2	3.367	1.508	0.888			
	SVAL3	4.388	1.805	0.758			
TRU	TRU1	3.907	1.706	0.842	0.848	0.908	0.766
	TRU2	4.072	1.607	0.907			
	TRU3	3.954	1.657	0.875			

Notes: SD = Standard Deviation, CA = Cronbach's Alpha, CR = Composite Reliability, AVE = Average Variance Extracted.

Table 3. Fornell-Larcker criterion. Values on the diagonal are the square root of AVE.

Construct		1	2	3	4	5	6	7	8
1	COMP	**0.832**							
2	BOND	0.399	**0.905**						
3	BRID	0.354	0.747	**0.941**					
4	HAB	0.450	0.427	0.312	**0.941**				
5	INT	0.229	0.345	0.289	0.565	**0.859**			
6	REC	0.189	0.461	0.371	0.453	0.542	**0.905**		
7	SVAL	0.236	0.456	0.340	0.397	0.465	0.641	**0.848**	
8	TRU	0.075	0.319	0.279	0.336	0.391	0.547	0.563	**0.875**

Table 4. Heterotrait-Monotrait (HTMT) criterion.

Construct		1	2	3	4	5	6	7	8
1	COMP								
2	BOND	0.455							
3	BRID	0.393	0.819						
4	HAB	0.497	0.467	0.333					
5	INT	0.241	0.378	0.311	0.613				
6	REC	0.217	0.517	0.407	0.498	0.612			
7	SVAL	0.278	0.538	0.389	0.451	0.553	0.751		
8	TRU	0.097	0.362	0.311	0.374	0.456	0.627	0.677	
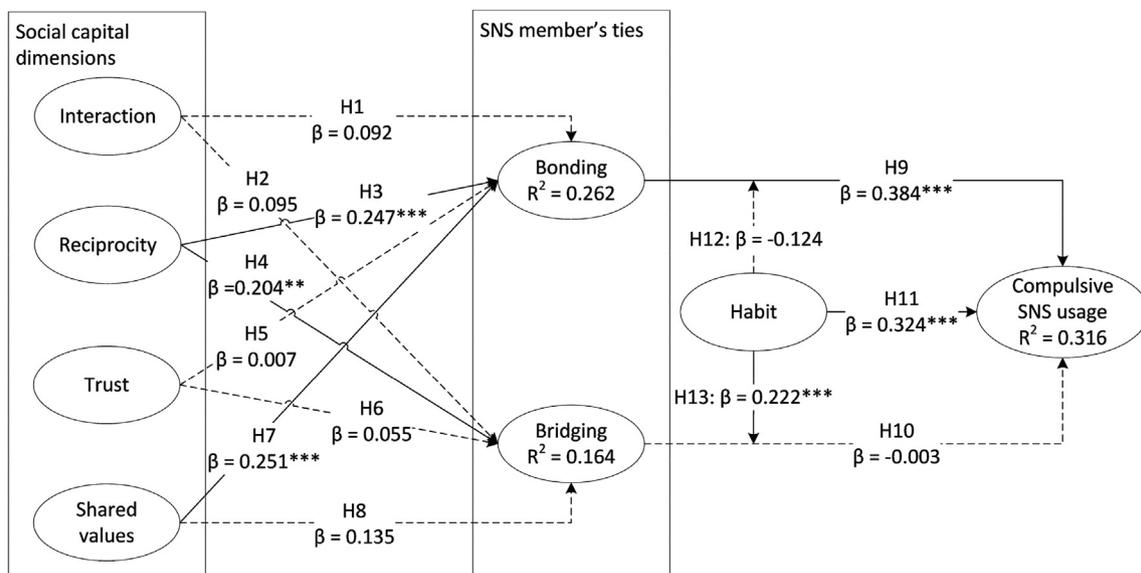
Figure 2. Estimated model. Non-significant paths are in dashed lines. Note: Significant at *p < 0.1; **p < 0.05; ***p < 0.01.

finding is in line with previous research in both online and offline environments. For instance, in the offline settings Lewicka (2005) found that people are more likely to participate in civic activities if they have stronger emotional and social ties with the neighbourhood. In the online settings, previous literature suggests that the SNS members are more likely to interact with others if they can provide support for their views expressed in comments or posts on SNS, thereby creating the conditions for higher frequency of use of SNS (Phua et al., 2017; Williams, 2006). In summary, interaction on SNS can lead to both positive and negative outcomes, which can include, for example, fostering civic engagement (positive) (Gil de Zúñiga et al., 2012; Naranjo-Zolotov et al., 2019) or SNS compulsive use behaviour (negative) (Liu and Ma, 2018; Longstreet and Brooks, 2017).

Reciprocity, the second social capital dimension evaluated in this study, has statistically significant associations of similar strength for both

bonding and bridging social capital. At first sight we may say that in the context of civil unrest the perception of reciprocity does not really distinguish between the bonding (strong ties) and bridging (weak ties) amongst members of the SNS. However, reciprocity has an indirect effect on compulsive SNS behaviour only through bonding and not through bridging, which may imply that reciprocity is value when interactions occur among members with strong ties. Our results complement those of previous investigations reporting a strong link mainly between reciprocity and bonding (Collins et al., 2014; Perkins et al., 2002). We may infer that in the context of civil unrest, the expectation of reciprocity in the form of support amongst SNS members who share similar ideologies, opinions, or political views, increases considerably.

Previous literature in the context of virtual communities is inconclusive regarding the effect of trust, the third relational dimension, over the use behaviour of its members. Naranjo-Zolotov et al. (2019) found

Table 5. Specific indirect effects. Significant effects in bold.

Paths	Indirect effect	p-Value
Trust - > Bonding - > Compulsive SNS usage	0,003	0,938
Interaction - > Bridging - > Compulsive SNS usage	-0,000	0,981
Shared Values - > Bonding - > Compulsive SNS usage	**0,097**	**0,038**
Shared Values - > Bridging - > Compulsive SNS usage	-0,000	0,980
Trust - > Bridging - > Compulsive SNS usage	-0,000	0,987
Interaction - > Bonding - > Compulsive SNS usage	0,035	0,280
Reciprocity - > Bridging - > Compulsive SNS usage	-0,001	0,977
Reciprocity - > Bonding - > Compulsive SNS usage	**0,095**	**0,029**

that trust was not significant for online citizen participation on e-government platforms. In the same line, Chen et al. (2021) found that trust does not influence behaviours as seeking information or share comments on SNS. On the other hand, Phua et al. (2017) found that trust significantly impacts the bonding and bridging social capital. Likewise, Lin & Lu (2011) showed evidence that trust in the virtual communities is positively associated with the quality of knowledge sharing. Our research found trust to be not significant over either bonding or bridging social capital in online environments, as is the case of SNS, meaning that the levels of trust are irrelevant for building bonding and bridging social capital.

The shared values and norms among members of the SNS, the fourth dimension of social capital evaluated in the current research, was statistically significant over bonding social capital and non-significant over bridging social capital. These findings may imply that in the context of civil unrest the users of a SNS pay more attention to the opinions and views of members with whom they feel closer than to the opinions of members with whom they have only a vague relationship. In periods of civil unrest it is expected that SNS users are more willing to search for and share information to support each other's views. Individuals are focused on strengthening links with SNS members who are already closer and known to share the same ideology and values, rather than debating with SNS members who hold different opinions or with whom they have weak emotional ties (Busso and Messina, 2020; Shah et al., 2019). These results are in line with those of studies reporting that shared values have positive effects on knowledge sharing and intention to use SNS (Jia et al., 2018; Lin and Lu, 2011).

In addition, shared values have a positive indirect effect on compulsive SNS behaviour through bonding social capital, meaning shared values may only influence compulsive SNS behaviour when interactions occur among members with strong ties. These findings are similar to those of other studies reporting that shared values are positively associated to attitude toward knowledge sharing and intention to share (Chow and Chan, 2008).

Bonding social capital is the strongest predictor of compulsive usage behaviour, even stronger than habit. Conversely, bridging was not significant over the compulsive use behaviour. This finding implies that when the interaction occurs among members who have a closer relationship, individuals are more likely to develop SNS compulsive use behaviour than when the interaction occurs among weakly-connected members. As mediator, bonding social capital is able to govern the nature between shared values and reciprocity with compulsive SNS usage. These results are in line with those of studies demonstrating that bonding social capital is positively related to collective efficacy (Collins et al., 2014), and partially contradict others that found a positive relationship between bridging social capital and SNS use (Huang et al., 2019) or both bonding and bridging with positive effects over SNS use (Horng and Wu, 2020). The relationship between the bonding social capital and compulsive usage behaviour also revealed a negative and small quadratic effect. The negative quadratic effect tells us that the relationship between bonding social capital and compulsive usage behaviours will reach a

point after which bonding will no longer influence SNS compulsive usage behaviour.

Habit has a positive and significant effect on SNS compulsive use behaviour. As literature suggests, under certain circumstances, such as civil unrests, some individuals may go beyond the habitual SNS usage patterns and develop compulsive use behaviours (Caplan, 2010; Seo and Ray, 2019). Other studies have found that patterns of posting on SNS may even change according to the day of the week, being more frequent on weekends (Li et al., 2017). Moreover, habit moderates positively the relationship between bridging social capital and the SNS compulsive usage behaviour, although not statistically significant. This may imply that only for high values of habit does the relationship between bridging and SNS compulsive usage behaviour become statistically significant and positive, whereas for low values of habit the relationship between bridging social capital and SNS compulsive usage behaviours is negative.

6. Conclusion

This study contributes to the theoretical body of knowledge in the area of information systems in two ways. First, having a context-specific case, it helps to explore constructs that may lead to SNS compulsive usage behaviour. Specifically, we rely on social capital theory to explain SNS compulsive usage behaviour in the context of civil unrest. Our findings show that shared values and reciprocity are the most significant social capital dimensions over bonding and bridging social capital. In turn, members included in the former type are more likely to show SNS compulsive usage behaviour. The findings provide new insights to understand the role of social capital and its types in the use of SNS as well as to discern which factors favour their compulsive usage. Second, even though social networking sites have already been adopted worldwide, most studies on SNS compulsive usage behaviour are performed on developed countries. Our research, based on a Latin-American country, is one of few that deals with SNS compulsive usage behaviour in a developing country, thereby, contributing with an alternative perspective about the worldwide problem of SNS compulsive usage behaviour.

7. Limitations and future research

Even though the study makes several contributions to the theoretical body of knowledge and practice, we acknowledge some limitations that can lead to opportunities for future research. First, the conceptualization and measurement of the compulsive SNS usage is still in the early stages of research (Turel and Serenko, 2012; van den Eijnden et al., 2016). Therefore, different definitions and scales employed in the literature regarding the compulsive SNS usage may limit the comparisons that can be made with similar studies. This limitation opens the opportunity for research to clearly define the different types of negative effects of SNS usage.

Second, the model was evaluated using a cross-sectional convenience sample from a country in the context of civil unrest. This fact may limit the generalizability of conclusions about the causal effects of the drivers evaluated in the research model. Future research may (i) collect a longitudinal sample of respondents, and (ii) add new constructs that facilitate subsequent comparison with other countries; for instance, the inclusion of a cultural dimension in the research model (Hofstede and Hofstede, 2005).

Third, during civil unrest events there may have been several factors, such as fake news, organizations trying to influence public opinion, the nature of publications and messages, that could influence bonding and bridging social capital. However, collecting data about these factors is very challenging. Moreover, data about the offline activities and their feedback over SNS is unsafe, because for this information the researchers may need to be in contact with the rioters and the ongoing offline action. Future research may collect data from multiple sources to study the reciprocity between online and offline actions and its effects on bonding and bridging on SNS.

Declarations

Author contribution statement

Mijail Naranjo-Zolotov: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Albert Acedo: Analyzed and interpreted the data; Wrote the paper.

Jorge Edison Lascano: Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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