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Does social capital play a role in information and communication technology adoption?

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Abstract

No study exists that examines the role of Social Capital on Information Communications Technologies (ICT) adoption/use. Several years ago, it was suggested by researchers that an inverse relationship existed between social capital (SC) and technology use. Since then, ICTs have evolved from isolating agents (e.g., television) to a platform for social interaction and political transformation. We examine whether SC influences ICT (the Internet in this case) use on a national basis. The study focuses on differences between 16 individual nations. Based on SC theory, we find positive relationships between all SC constructs and ICT usage, except for personal trust.

Keywords: social capital, information and communication technology adoption, trust, advanced and emerging economies

Introduction

The advent of the Internet/Web has changed the perspective in which we view the relationship between technology and Social Capital (SC) (De La Torre and Moxon, 2001). Since then, information and Communications Technologies (ICTs) have evolved from isolation engendering to social enhancing agents (Luo and Bu, 2016). Unlike unidirectional technologies such as television and Digital Video Recorders, today's technologies promote interactivity and use richer media (Li et al., 2015). Social networking technologies allow individuals and groups to share interests and activities, in real-time, or near real-time (Chang et al, 2016). Conversations made over the internet can simulate face-to-face conversations with the addition of inexpensive web cameras (Pinjani and Palvia, 2013). Civic engagement, an area that most concerned Putnam (1995), seems to have increased due to ICTs. The Pew Research Center's Internet and American Life Project (Pew, 2020) found that 44% of 18- to 29-year-old Americans reported using social media to engage with political or social issues in 2020. Volunteerism is also an important form of civic engagement, with nearly one-third of Americans reporting that they volunteered their time to an organization in 2020. According to the 2021 Pew Research study on "Internet and Life Satisfaction," most people in advanced economies feel that the Internet has had a positive impact on their lives, with 72% of adults saying it has been mostly good for them personally. Those users who are highly engaged with the Internet, especially social media, are more likely to report higher levels of stress and anxiety.

In the present study, we explore the impacts of various components of SC on ICT usage (the Internet in the present study). Although the impact of trust on ICT use has been previously studied, we have not found any study that uses a comprehensive approach to investigate the effects of various forms of SC (four different

forms of Trust, Civic Engagement, and Life Satisfaction) on ICT use. The present study addresses this gap in the literature and hence contributes significantly to the body of knowledge on the relationship between components of SC and ICT use. Additionally, we address the question:

> *"How do emerging economies differ from advanced economies in terms of the impact of SC on ICT use?"*

Social networks have led to increased use of the Internet/Web. The top 15 most popular social networks in 2023 have combined active users of 15 billion (https://www.dreamgrow.com/top-15most-popular-social-networking-sites/). The use of the Internet for delivering government information and services to the citizens (e-government) has shown similar increases. A report from Organization for Economic Co-operation and Development (OECD, 2019) (https://goingdigital.oecd.org/en/indicator/58) indicates that, on average, over 51% of all OECD individuals regularly used e-government sites (ranging from over 74% (Korea and UK) to 26% (Sweden)). Corporations in those countries relied more heavily on e-government; on average, 87% of businesses claim to use e-government services on a regular basis. The implication is that increased social activities lead to increased technology use.

Social capital (SC) has been viewed in literature as both cause and effect (Zheng et al., 2014). This study considers the relationship between SC, which serves as the basis of Putnam's tenets, and its impact on internet use. SC theory has been applied in a number of Information Systems studies (Lu et al, 2013). As with other forms of capital (e.g., economic, physical, environmental, and cultural), there is an assumption that SC is invested with an expectation of future returns (Adler & Kwon, 2002); can be appropriated in the future (Coleman, 1988); requires maintenance (Gant et al, 2002); and as with economic capital, is assumed to benefit national well-being (Narayan and Cassidy 2001); political stability (Kenworthy, 1997); and economic development (Fukuyama, 2000). We expect that SC and ICT adoption will vary between nations.

We use data from 16 nations that the International Monetary Fund (IMF) categorizes as Emerging Developing Economies (EDE). In a global level study, it is necessary to consider a representative set of nations and delineate the difference in usage factors of EDEs. The study offers an additional delineation of Internet usage. Aldridge et al (2002) warn that some of the empirical evidence on the importance of SC should be treated with caution because of the misspecification or ambiguity of equations or models used to estimate its impact. On a collective level, SC is often assumed to be represented by norms, trust, and social cohesion (ChungLeug et al., 2008). While trust, the most cited component of SC, has received considerable attention on an individual and firm-level basis and it has seldom been considered at a multination, individual-use, level (Rao et al., 2005; Ahmed, 2018; Ahmed et al., 2019). In the following sections, we overview SC theory and the constructs used to represent SC, followed by a discussion of measures of SC, the research model and hypotheses, data, methodology, results, discussion, and conclusions.

Social Capital Measures

The term social capital is generally attributed to Bourdieu (1986) and Coleman (1988) and is a comprehensive concept that includes the 'norms and networks facilitating collective actions for mutual benefits' (Woolcock, 1998, p 155). Belliveau et al (1996) view it as "an individual's personal network and elite institutional affiliations" (p. 1572), while Fukuyama (2000) views SC as the existence of a certain set of informal values or norms shared among members of a group that permits cooperation among them. The constructs of Social Capital are multi-dimensional and multidisciplinary (Ahmed et al., 2019; Zheng et al., 2014). SC is viewed as the raw material of civil society but differs in that it exists in relationships between people built on trust (Bourdieu, 1986). For the present study, we decide to limit the SC constructs to the following: Trust (personalized trust, trust in government, moralistic trust, Civic Engagement (CE), and Life

Satisfaction (LS), which has previously been considered an element of SC (Shah et al, 2010; Jun et al., 2021; Zhang et al., 2021). These constructs form the proposed research model.

Although not listed among Putnam's (2000) measures of SC, several researchers have considered Life Satisfaction (LS), or happiness in life, as an element of SC (Shah et al, 2010). Mota and Pereira (2008) suggest that LS happiness is a function of economic well-being, the quality of public institutions and social ties. LS provides a motive for, and benefit of, CE (Shah et al, 2010), and has been correlated with civic participation and trust (Rutter & Smith, 1995). Becchetti et al (2008) found that LS affects a wide range of social activities, from volunteering and spending time with friends and attending social gatherings and cultural and sports events. At a national level, (2008) found that LS was positively correlated with life expectancy and negatively correlated with death rates.

Research Model and Hypothesis

The research model is shown in Figure 1. As discussed above, the model relies on an individual-level analysis and considers the relationship between Internet use and social capital. In general, we anticipate that all forms of trust are related to internet use. However, we expect MT, which does not rely on the concept of reciprocity (as do other forms of trust), to have the greatest impact. MT presumes an optimistic view of the world and one's ability to control it and reflects the concepts of bridging and linking SC (as opposed to bonding SC), and thus serves to expand the skills and network resources, that are not accessible in other ways (Onyx & Bullen, 2000).

Trust in known others may not impact ICT adoptions. Uslaner (2003) observed that for most types of Internet use, such as receiving and sending email, expressing personal views online, and online buying, trust either does not matter or has only a limited impact. Shah et al (2010) found a negative association between the Internet and SC, suggesting that the use of the Internet for social recreation diminishes social capital, especially trust and life contentment. Junghee and Hyunjoo (2010) found that the online community does not seem fully associated with SC, particularly its socio-psychological components, trust, and life contentment. In particular, people who are near or far may not matter much when using the Internet; everyone can be accessed equally well through the Internet.

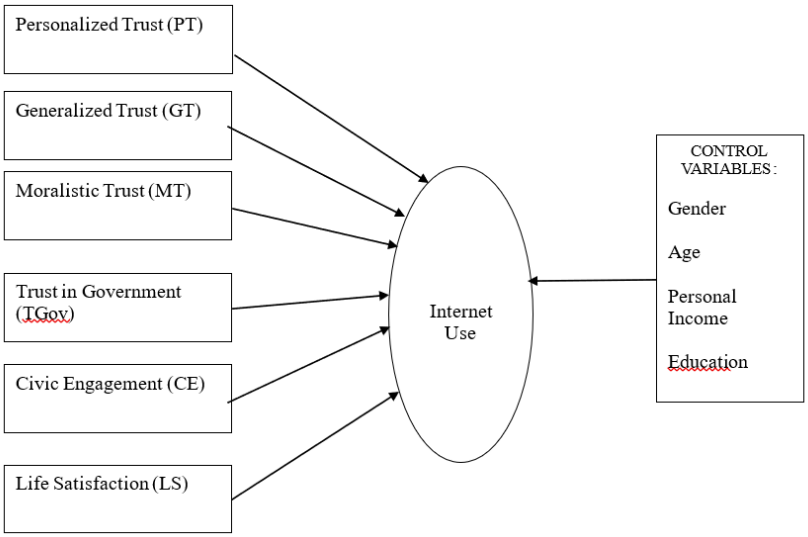

Figure 1: The Research Model

Our hypotheses, therefore, are:

H_1: *Personalized Trust (PT) is positively related to internet use.*

H_2: *Generalized Trust (GT) is positively related to internet use.*

H_3: *Moralistic Trust (MT) is positively related to internet use.*

H_4: *Trust in Government (TGov) is negatively related to internet use.*

H_5: *Civic Engagement will have a positive impact on internet use.*

H6: *Life satisfaction will have a positive impact on internet use.*

Data

The World Values Survey (WVS, 2010) provides validated measures for all the different variables (see Table 1) considered in this study at an individual level from more than 1,000 respondents in 52 countries, representing approximately 85% of the world's population. All data were obtained from the WVS fifth wave, which was conducted from 2005 to 2008 and released in 2009 and contains approximately 1,000 variables, and 82,992 observations from 57 different countries. Thus, the data set was representative of world nations; the specific nations chosen were based on data availability. The 16 nations included in the present study are listed in Table 2, and the questionnaire items' summary measures are provided in Table 3. The WVS does not ask all questions in all countries and tends to change the questions asked in each wave, hence missing values are to be expected. Approximately valid responses used in this study came from 16 countries.

Results

The combined loadings and cross-loadings were satisfactory. All factor items load at 0.5 or better. There were no cross-loadings and each of the item loadings was significant at $p < 0.001$. The Convergent Validity Analysis (CVA) results are discussed next. Three metrics were considered: Composite Reliability, Cronbach's alpha, and the Average Variance Extracted (AVE). It is generally agreed that both the composite reliability and Cronbach's alpha coefficients should be equal to or greater than 0.7 (Fornell & Larcker, 1981; Nunnally & Bernstein, 1994), although a more relaxed version assumes that only one of the two coefficients need be equal to or greater than 0.7 (Kock, 2022). Following the more rigid criteria, all but two of the constructs (PT and GT) were acceptable; if the relaxed version is followed, all constructs are acceptable.

While AVEs are normally used for discriminant validity assessment, they can be applied to CFA. For convergent validity assessment, the threshold frequently recommended for acceptable validity is 0.5 (Fornell and Larcker, 1981; Kock, 2022). In our model, four of the six constructs are acceptable. Full collinearity variance inflation factors (VIFs) have also been used in CFA to check for multicollinearity. VIFs of 3.3 or lower suggest the existence of no multicollinearity in the model (Kock, 2022), which is also the recommended threshold for model acceptability (Cenfetelli and Bassellier, 2009), although some relaxed versions suggest that the metric should be lower than 10 (Hair et al., 2009). In our model, all VIFs were less than 1.3. To test for Discriminant Validity, AVEs for each latent variable were again considered. In this case, the square root of the AVE should be higher than any of the correlations involving that latent variable (Fornell and Larcker, 1981). All AVEs are acceptable. Since Internet Use is a binary variable (0 = not used last week; 1 = used last week), a Binary Logistic Regression was performed (Table 4). Table 5 shows the summary of the outcomes of the tested hypotheses.

Table 1: Study Variables

DVs	Study Var -WVS Var	Question Asked	WVS Values
Internet	IntUse -e253	Information source: Internet, Email	0 = not used last wk; 1 = used last wk
PT	TrustFam -d001	How much do you trust your family	1 = completely, …, 5 = not at all
	FamImp -a001	Important in life: Family	1 = very imp; 5 = not at all imp.
	FriImp -a002	Important in life: Friends	1 = very imp; 5 = not at all imp.
GT	PeoTrust -a165	Most people can be trusted	1 = can be trusted; 2 = can't be trusted
	PeoTAdv -a168a	Most people try to take advantage you	1 = take advantage; 10 = try to be fair
MT	TrustFirst -g007_34	Trust: People you meet for 1st time	1 = completely, …, 5 = not at all
	TrustDRel – g007_35	Trust: People another religion	1 = completely, …, 5 = not at all
	TrustDNat -g007_36	Trust: People another nationality	1 = completely, …, 5 = not at all
TGov	ConArm -e069_02	Confidence: Armed Forces	1 = a great deal, …, 4 = not at all
	ConPol -e069	Confidence: The Police	1 = a great deal, …, 4 = not at all
	ConGov -e069_11	Confidence: The Government	1 = a great deal, …, 4 = not at all
	ConJust -e069_17	Confidence: Justice System	1 = a great deal, …, 4 = not at all
CE	MemArt -a100	Active/Inactive Memb. Art/music/edu.	0 = not member ... 2 = active member
	MemPol -a102	Active/Inact. Memb. Polit. Party	0 = not member … 2 = active member
	MemEnv -a103	Active/Inactive member. Environ. Org.	0 = not member … 2 = active member
	MemChar -a105	Active/Inact. Memb. Charit./humanit.	0 = not member … 2 = active member
	MemCon -a174	Member. consumer organization	0 = not member … 2 = active member
LS	Happy -a008	Feeling happiness	1 = very, …, 4 = not at all
	SatLife -a170	Satisfaction with your life	1 = dissatisfied, …, 10 = satisfied
	SatFin -c006	Satisfaction with financial situation	1 = dissatisfied, …, 10 = satisfied

Table 2: Nations Included in The Study

Country	Code	Total Num	Val. N	Percentage (%)
Brazil	BRA	1,500	1,303	86.87
Bulgaria	BGR	1,001	558	55.74
Chile	CHL	1,000	725	72.50
China	CHN	2,015	584	28.98
Ethiopia	ETH	1,500	949	63.27
Georgia	GEO	1,500	898	59.87
Ghana	GHA	1,534	1,136	74.05
India	IND	1,998	866	43.34
Indonesia	IDN	2,015	1,197	59.40
Malaysia	MYS	1,201	1,058	88.09
Mali	MLI	1,534	408	26.60
Mexico	MEX	1,560	1,206	77.31
Moldova	MDA	1,046	855	81.74
Morocco	MAR	1,200	878	73.17
S. Africa	ZAF	2,988	2,408	80.59
Thailand	THA	1,528	1,338	87.57
Total Average		25,120	16,367	65.16

Table 3: Summary of Study Items

Item	Min	Max	Mean	S.Dev.
Intuse	0	1	.20	.402
PCUse	1	3	1.53	.761
TrustFam	1	5	4.77	.604
FriImp	2	5	4.27	.773
FamImp	2	5	4.92	.306
PeoTrust	1	2	1.20	.402
PeoTAdv	1	10	5.54	2.826
TrustFirst	1	5	2.11	1.128
TrustDRel	1	5	2.75	1.278
TrustDNat	1	5	2.50	1.263
ConArm	1	4	2.82	.886
ConPol	1	4	2.51	.923
ConGov	1	4	2.56	.924
ConJust	1	4	2.57	.941
MemArt	0	2	.37	.677
MemPol	0	2	.31	.596
MemEnv	0	2	.26	.576
MemPro	0	2	.27	.590
MemChar	0	2	.29	.607
MemCon	0	2	.20	.502
Happy	1	4	3.14	.772
SatLife	1	10	6.65	2.349
SatFin	1	10	5.80	2.501

Table 4. Binary Logistic Regression Results for Internet Use

	B	SE	Sig.
PT	0.037	0.027	0.168
GT	0.066	0.024	**0.007**
MT	0.124	0.024	**0.000**
TGov	-0.116	0.025	**0.000**
CE	0.242	0.024	**0.000**
LS	0.141	0.030	**0.000**

Table 5. Overview of Hypotheses Outcomes

	Hypothesis	Supported?
H1	Personal Trust (PT) has a positive impact	No
H2	General Trust (GT) has a positive impact	Yes
H3	Moral Trust (MT) has a positive impact	Yes
H4	Trust in Government (TGOV) has a negative impact	Yes
H5	MT has a greater impact than PT or GT	Yes
H6	CE has a positive impact	Yes
H7	Life Satisfaction (LS) has a positive impact	Yes

Conclusion

The present study offers several contributions. This study contributes new findings to the general body of information systems knowledge and offers support for the argument that SC can promote global individual usage of ICT. Our assumption that most forms of SC had a positive association with present-day technology was appropriate; higher levels of ICT use are associated with higher levels of trust (especially MT), higher CE, and higher life satisfaction, and only trust in government was negatively related. This study also has some managerial implications for involvement in social media networks, especially for small businesses, but they come with some caveats. According to Outbound Engine (2016), 40 million small businesses use Facebook to over 1 billion people visit pages each month. The majority of these think social media is irrelevant to their business. According to the same article, small business owners are being sold on the strategy of social by 'experts' who are seeking revenues from small business owners to pay for the service. They should be using social networks to bring in new sales dedicated to the day-to-day operations. Forbes (2023) suggests, "If you're selling insurance, or plumbing, carpeting or other services, listen to people complaining about their current service providers. Those are leads worth pursuing." In general, small businesses need to concentrate on their social presence as an extension of what is taking place in their physical locations and making their customers feel connected. Finally, we were able to demonstrate that high internet use is associated mostly with high SC. A future study can investigate the role of SC in the adoption of other ICTs.

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