Political Engagement and ICTs: Internet Use in Marginalized Communities

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Information and communication technologies (ICTs) provide a distinctive structure of opportunities with the potential to promote political engagement. However, concerns remain over unequal technological access in our society, as political resources available on the internet empower those with the resources and motivation to take advantage of them, leaving those who are disengaged farther behind. Hence, those who face digital inequalities are not only deprived of the benefits of the so-called *Information Society*, they are also deprived of exercising their civic rights. To promote political engagement among the marginalized, we analyze different sociotechnical factors that may play a role in promoting their inclusion in future political activities. We employed a survey for marginalized communities to analyze a set of research questions relating to sociotechnical factors. We show that online content creation, digital freedom, and access to the mobile Internet may positively impact political engagement. The development of these factors may not only promote the inclusion of marginalized populations in future political events, but also help to build a more equal society where everyone's voice has a chance to be heard.

Information and communication technologies (ICTs), such as social media, the Web 2.0, and smartphones, are changing the ways that activists collaborate and engage in political action. Scholars have been analyzing how ICTs have affected the social movement landscape, from a system developed by Google and Twitter to circumvent the Egyptian state-censored Internet (Howard & Hussain, 2011) to smartphone-coordinated protests against Wall Street (DeLuca, Lawson, & Sun, 2012). As claimed by Garret (2006), ICTs afford a variety of capabilities that can be used to augment users' ability to engage with and retain political and civic information, thereby facilitating increased participation. ICTs yield fundamental affordances when compared to other forms of mass media. They represent both a two-way network for communication and a medium for information, which stimulates political participation (Mossberger, Tolbert, & McNeal, 2007).

Institutions, nongovernmental organizations (NGOs), and governments are relying more and more on digital platforms to provide services and organize themselves. Some fundamental services, such as the Patient Protection and Affordable Care Act (PPACA), only support online and telephonic enrollment (Gonzales, Ems, & Suri, 2014). Due to this growing shift towards online services, studies on political and civic engagement and ICTs have also grown at a fast pace since the past decade. However, these studies focus heavily on the portion of the population that has easy access to ICTs and does not experience major impediments when using them (see Caren & Gaby, 2011; Neumayer & Stald, 2014). Even those studies that focus on political engagement in developing countries, such as Egypt (Howard & Hussain, 2011), Malaysia (Postill, 2014), and the Philippines (Rheingold, 2007), analyze the use of technology by those who belong to a higher and privileged position in their countries. As described in the previous paragraph, ICTs provide a distinctive structure of opportunities that has the potential to promote political engagement; however, as claimed by Norris (2001), concerns remain that given the unequal technological access present in virtually every country, political resources available on the Internet empower those with the resources and motivation to take advantage of them, leaving the disengaged further behind. Those who are marginalized and face digital inequalities are not only deprived from the benefits of the so-called *Information Society*[1] but are still underrepresented in the literature.

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[1]For more information on the Network and Information Society see Castells (1996).

The marginalized population that we focus on in this paper is the favela residents of Vitória, Brazil. Brazil inherited a highly stratified society from the colonial system, one that still persists to this day. The country's population is categorized into five social classes—A, B, C (C1, C2), D, and E,— which are based solely on people's wealth and income (Vaitsman & O'Dougherty, 2003). The families in classes C2, D, and E are considered poor and inhabit the slums and marginalized areas in Brazil. They are not only deprived of proper services for their basic needs, such as health, education, and basic sanitation, but also face access barriers to technology and the Internet. As claimed by Neri (2012), while 75% of the upper social classes (A, B, and C1) have Internet connection, only 25% of the lower classes (C2, D, and E), such as favela residents, manage to get online; most of them rely on community technology centers (CTCs), such as telecenters and Local Area Network (LAN) houses. This scenario of social and digital inequalities has limited the political engagement of favela residents, as we show in the case of the 2013 protests in Brazil, the largest protests in the history of the country, where favela residents once again saw themselves excluded from political activities.

Promoting political and civic engagement encourages social inclusion (Warschauer, 2004), and one way of promoting it is by informing marginalized citizens through technology. Consuming political information online helps citizens obtaining higher levels of political knowledge, which leads to a higher interest in politics and more frequent deliberation with fellow citizens about politics (Mossberger et al., 2007). To tackle these challenges, we analyze different sociotechnical factors that may play a role in promoting the inclusion of marginalized populations in future political activities. We employed a survey for marginalized communities; a quantitative approach was used to analyze the survey data and a set of research questions relating to sociotechnical factors. The research questions are addressed based on statistical analyses that aim to identify relationships between factors. The findings are further incorporated under a structured equation model. Finally, discussion and recommendations for governments and organizations are provided based on the findings of this study

This paper is part of a broader study that aims to analyze and understand the sociotechnical engagements and practices of people who belong to marginalized communities. Approaching technology with the perspective of marginalized persons offers a different window for understanding ICT use, political processes, social tensions, and cultural values, especially as it pertains to those experiencing digital inequalities. Bringing a different experience to the attention of policymakers and technology designers may foster the development and promotion of suitable technology for those who face socioeconomic inequalities.

The 2013 Protests in Brazil[2]

On October 30th, 2007, Brazil received one of the most anticipated news events in years: the land of soccer was selected to host the 2014 FIFA World Cup. Six years later, as Brazil was getting ready to host the FIFA Confederations Cup, an official test event for the World Cup, the excitement that enthralled the Brazilian people turned into deep frustration. In June of 2013, an avalanche of protests led more than one million people to the streets in over a hundred cities in Brazil. The wave of protests began in early June in the city of São Paulo and spread throughout the country, motivated by an increase of R$0.20 (or 8%) in the public transportation fare (Saad-Filho, 2013). The protests grew to include a much larger set of issues faced by Brazilian society. The protesters were dissatisfied with the government due to the increase of corruption and impunity (Trigo, 2013). They were also frustrated due to the government's billion-dollar spending on stadiums for the World Cup, as they were not seeing the same, or even a close to the same, investment geared towards solving the nation's problems.

The first protest in Vitória took place on June 17th, 2013. It was organized by middle-class university students on Facebook under two popular groups: *Utilidade Publica* (ES) (Public Utility) and *Não é por 20 centavos* (It's not just 20 cents). The protest gathered 20,000 people, started from the Federal University of Espírito Santo (UFES), and toured 11 kilometers, passing through the most important avenues in the city until reaching the official residence of Espírito Santo's governor, Renato Casagrande (Nossa, Tedesco, & Borges, 2013). The protesters were mostly white and had the manners and garments that are typical of upper-class citizens. Because the group members were mostly students and belonged to the upper classes, the information about the protests never reached Facebook users from marginalized classes, who also have limited access to ICTs. The social divide that took place in Vitória, defined by geography and income, was also mapped online, as the rich and poor social networks did not overlap (Nemer, 2016).

Due to the success of the June 17th protest, the protest organizers gained the interest and attention from mainstream media, such as local TV channels and newspapers, and announced a new protest for June 20th, 2013. As the information about the new protest was available through less exclusive channels, the favela dwellers became interested in the protests and organized their own Facebook group to come up with a list of demands. The June 20th protests made history by gathering more than 100,000 protesters in the streets of Vitória, forming the largest public demonstration ever registered in the state of Espírito Santo (Nossa & Borges, 2013). The organizers of the first protests belonged to an upper class that did not overlap with lower classes, online or offline. As a result, the protestors from marginalized communities came to the streets at a later time and their voices and requests were not as privileged as the ones shouted by the rich (Nemer, 2016). When the favela residents joined the protests in Vitória, they joined a group that already had a list of demands stipulated by the members of the upper classes, the first group of protesters, and thus did not have their demands amplified as the upper class' demands. Furthermore, in addition to the lack of social ties

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[2]This section is based on the first author's ethnography in Vitória, Brazil. For more information, see Nemer (2015b).

between the people from different social classes, the socio-technical conditions in which the poor live also influenced their political engagement. The protests in Vitória, Brazil, represent a clear case of the potential ICTs have to promote political activities and how they affect those who are in the social and technological margins. Therefore, the aim of this paper is to bring to light the experiences of these favela residents in order to address this particular problem and to better understand the role of ICTs in promoting political engagement among the marginalized.

Related Works

Recent studies on political and civic engagements revolve around Internet adoption and social media use (Caren & Gaby, 2011; Neumayer & Stald, 2014). This type of engagement with the Internet can often help individuals make sense of the world or provide them with previously unknown experiences. In turn, this engagement with the Internet could impact how individuals perform volunteer activities online or participate in political movements. An early study on social media performed by Weber, Loumakis, and Bergman (2003) demonstrated that Internet engagement has a direct effect on civic and political participation. However, the same study also pointed to existing socioeconomic discrepancies regarding political engagement. The socioeconomic disparities that existed prior to wide Internet use appear to have persisted even after the wide adoption of social media adoption by society. A similar study also noted that while online discourse can have an effect on the political opinions of participants, it does not have the same effect on spectators (John, Sturgis, Smith, & Nomura, 2009). Furthermore, due to the nature of online design, all participants are not equally exposed to background information material that can otherwise be provided in a face-to-face environment (Nemer, 2013c). Highlighting the difficulty moderators face in motivating participants online to participate in discourse was another finding of the study. These findings suggest that Internet engagement can likely have an effect on public discourse that would also exist for marginalized groups. However, evidence of this link has yet to be provided, especially for groups with limited Internet access, such as those living in favelas.

To investigate the aforementioned relationship, we devised a set of questions that aimed to understand people's political engagement. These included measuring online volunteer and political participation, as well as sharing information about protests and participating in them. Similarly, we measured Internet engagement attitudes through measurements of Internet use as a tool for understanding the world and acquiring previously unknown experiences. This leads us to the formulation of following research question:

Q1: Do Internet engagement attitudes affect political engagement?

Furthermore, the studies previously discussed also highlight the socioeconomic differences that result in variances regarding Internet engagement by individuals (Weber et al., 2003). We postulate that this is likely due not only to a lack of Internet access but also to a lack of technological efficacy. Internet and computer use has been linked in the past to Internet and computer efficacy (Eastin & LaRose, 2000). Technology efficacy is often understood as the ability to utilize technologies to solve problems and to find answers to questions. Additionally, previous work in favelas has identified that the majority of the population encounters difficulties with technology that are otherwise inexistent in the majority of the population outside favelas. For example, the nature of the keyboard and the orientation of the keys was found to be puzzling by many of the participants in an ethnographic study in a favela (Nemer, Gross, & True, 2013).

Q2: Does technological efficacy affect Internet engagement attitudes?

Studies have also found a connection between mobile access and political engagement (see Campbell & Kwak, 2010; Wei, 2014), but this relationship has never been explored in marginalized groups. Mobile access can enable the immediacy of information, which can assist with the time-sensitivity of many political events. Additionally, for many individuals living under the poverty line, mobile access to the Internet can often be a cheaper option. We thus formulated the following research question:

Q3: Does access to devices that support mobile Internet affect political engagement?

The link between social media use and political engagement is often related not only to political participation but also to content generation (Leung, 2009). This becomes particularly relevant in the context of current social media platforms, where user participation and user-generated content is at the core of the Web 2.0 experience (Kaplan & Haenlein, 2010). In particular, content creation is seen as a potential factor not only for the dissemination of information but, more importantly, for the generation of original information that can be distributed over social media. In this study, we referred to content creation for two particular social media activities, contributing to blogs and contributing to collaborative wiki projects, such as Wikipedia.

Q4: Does content creation affect political engagement?

Digital freedom is another common reason that can impede political engagement. In countries where there is a tighter control of freedom of expression on the Internet, political movements and innovation could stagnate (see Shen, Wang, Guo, & Guo, 2009). This is often due to a link between freedom and expression, which is necessary for sustaining movements both online and offline. Digital freedom can be measured by how individuals feel about expressing themselves online as opposed to offline. It can also be indirectly measured through the extent to which they suffer racial or social prejudice online. Marginalized populations can often carry their attitudes online, where they may be afraid of expressing their opinion. This is likely to impede online political organizing, as well as offline political engagement. Ethnographic data have found this to be the case for a portion of the population in favelas (see Nemer, 2016). Based on these findings, we aimed to identify to what

degree freedom of expression influences political engagement for marginalized populations.

Q5: Does digital freedom of expression contribute to political engagement?

Methods

Context

The neighboring favelas of Bairro da Penha, Gurigica, São Benedito, and Itararé, in the city of Vitória, Brazil, were chosen as the study site. Favelas are considered the "wrong" places for studying technology because they are outside the main economic, technological, and political centers. However, studying peripheral places allows us to learn about places and their importance in today's "knowledge economy" (Takhteyev, 2012). Similar to other urban slums, Brazil's favelas are typical marginalized settlements occupied by squatters who have limited access to digital technologies and often lack public services, recognition, education, and financial self-sufficiency. Favelas are usually "governed" by drug lords who ensure residents' safety through their actions and political connections (Nemer, 2013b). By enforcing their own laws, drug lords maintain order in the favelas. Residents in the favelas respect them because these drug lords create a local ecology where most residents feel safe despite the high level of violence (Perlman, 2006).

The most famous favelas in Brazil—Rocinha and Cidade de Deus (City of God)—are in the city of Rio de Janeiro. To prove that the city was a safe venue for the World Cup in 2014 and for the Olympic Games in 2016, police officers expelled drug traffickers from Rio. Drug dealers who escaped hid in favelas in nearby cities, such as Vitória (do Val, 2012), turning these slums into war zones. Drug dealers from Rio de Janeiro teamed up with the rival cartel from Bairro da Penha and are trying to take over Gurigica and São Benedito. As in other favelas, most people living in Gurigica, São Benedito, and Itararé rely on LAN houses and telecenters to access computers and the Internet. LAN houses are privately owned establishments where—similar to a cybercafé—people can pay to use a computer with Internet access and a LAN. In contrast, telecenters are facilities supported by the state and nongovernmental organizations where the general public can access computers for free. LAN houses, telecenters, and other technology access establishments such as libraries are considered community technology centers (CTCs) (Nemer & Reed, 2013). The first author conducted fieldwork in these areas, which was challenging but rewarding. It shed light on the role of digital technologies in the daily lives of marginalized people who are situated in an extraordinarily complicated social, cultural, political, and economic context.

This study was conducted in two phases: phase A, between June and July 2012; and phase B, between April and October 2013. In phase A, the first author performed an ethnographic exploratory study of the field, which was conducted with the intent of understanding the problematic regarding digital inequalities and inclusion in the favelas of Vitória, Brazil (Nemer, 2015a). During phase A, the first author was able to gain access to the neighboring favelas, which is not easy because drug cartels usually disapprove of outsiders in their territory. In phase B, the author focused on the ethnographic study of the favelas and telecenters. The population of interest was individuals from the marginalized communities of favelas who utilize Internet and social media applications. The author deployed three main methods to collect data for this article: (i) participant observation inside and outside the CTCs; (ii) in-depth and semistructured interviews with CTC users ($n = 56$); and (iii) a survey deployed in 14 telecenters located in poor neighborhoods ($n = 107$).

Survey

A 53-question survey was dispatched during phase B. A combination of volunteer and convenience sampling was employed in 14 telecenters where users contributed a total of 107 completed surveys.[3] According to Koch and Emrey (2001), this sample size ($n = 107$) is characteristic for the study of marginalized populations due to issues regarding access to this informant group. Difficulties in surveying these populations, both in terms of methodology as well as in terms of recruitment, have been observed in past studies (Benoit, Jansson, Millar, & Phillips, 2005). In the case of the marginalized population in Vitória, individuals were in fear of their lives from drug cartels and thus avoided associating themselves with anything relating to research or press (Parra, Nemer, Hakken, & D'Andrea, 2015). Surveys are perceived as a good method to gather data and gain an initial and general sense of the field (Sieber, 1973). As such, a pilot study was conducted during phase A. The aim was to gain a general idea of this population's experiences and technology use. The pilot unraveled the difficulties in communicating effectively with the population in the favelas. For example, respondents were puzzled when asked questions relating to technology, such as *"Do you use any social networking site?"* or *"Do you have a notebook [laptop] at home?"* A lack of knowledge of their customs, slangs, terms, and communication patterns did not allow for engaging in quick conversations or performing activities involving deep conversations, such as surveys. Madison (2012) suggests that methods such as surveys should be conducted only when the ethnographer is already immersed in the field, has a deep understanding of the informants' customs, and does not have communication barriers with the informants.

Three months into phase B and after getting acquainted with local communication patterns and terms, a new survey was conducted with the assistance of telecenters' Inclusion

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[3]Convenience sampling is a nonprobability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher (Herring, 2010). Convenience sampling has been successfully used in past studies (see Schwarcz, Spindler, Scheer, Valleroy, & Lansky, 2007), and it was used in this study due to its effectiveness in acquiring the participation of CTC users in marginalized communities.
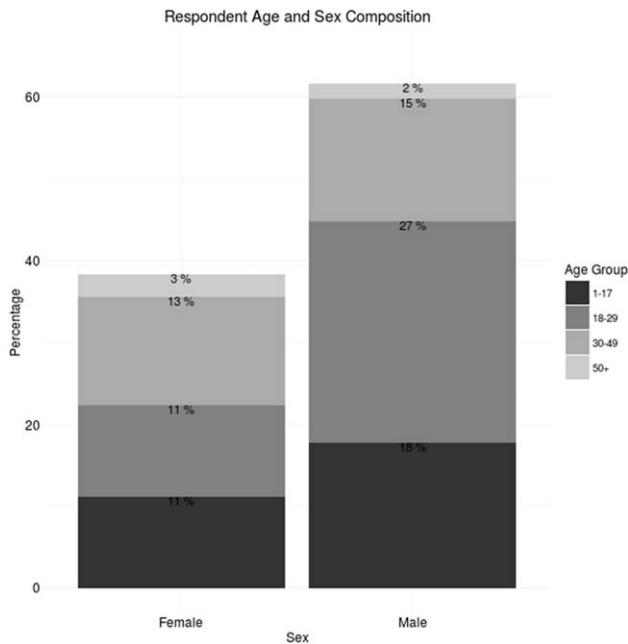
Respondent Age and Sex Composition

FIG. 1.   Respondent age and sex composition.

	TE1	TE2	TE3	TE4	IEA1	IEA2
TE2	.46***					
TE3	.49***	.25*				
TE4	.30**	.22*	.34***			
IEA1	.37***	.20*	.24*	.41***		
IEA2	.41***	.22*	.29**	.43***	.51***	
IEA3	.30**	.18*	.19	.10	.31**	.42***

Note. Significance levels:*$p < .05$;**$p < .01$;***$p < .001$.

TABLE 2.   Spearman correlation table for the set of questions relating to political engagement (PE) and Internet engagement attitudes (IEA).

	IEA1	IEA2	IEA3	PE1	PE2	PE3	PE4
IEA2	.51***						
IEA3	.31**	.42***					
PE1	.13	.12	.16				
PE2	.27**	.23*	.25*	.43***			
PE3	.21*	.20*	.18	.50***	.56***		
PE4	.28**	.28**	.27**	.41***	.32***	.37***	
PE5	-.10	.01	.07	.37***	.34***	.29**	.05

Note. Significance levels:*$p < .05$;**$p < .01$;***$p < .001$.

Agents.[4] The new survey was designed to better fit the context of the favelas in terms of avoiding misunderstandings with its questions and goals. The questions from phase B were adapted. For example, the newer version included questions such as *"Do you have a Face [Facebook]?"* and *"Do you have a note [from notebook, which means laptop]?"* Previous work has shown that telecenters are considered safe havens by this population and that it is easier for them to open to researchers there (Nemer, 2013a). There were a total of 107 respondents who took part in the survey. To incentivize participation, respondents were given an "extra 30-minute voucher" to be added to their already free 1-hour use of the computers at the telecenters. The voucher was authorized by the telecenter manager.

All questions utilized for the purposes of this study are included in the Appendix in their translated form in English. Codes were used in the analyses that follow to avoid redundancy.

Results

Descriptive Data

Demographic data for the respondents are provided in Figure 1. Female participants in the survey accounted for 38.32%, which approximates the%age of the female population of Internet users in Brazil (Neri, 2012). The majority of the respondents were also young, with males being slightly younger than females. Most people who took part in the survey reported accessing the Internet most often from a

telecenter. Approximately 23% of individuals reported accessing the Internet from home, 12% from a cellphone or tablet, 3.7% from a LAN house, and 1% from work. Although the most frequent location where people reported accessing the Internet was not their cellphones, 49.5% of individuals reported having a device that could access mobile Internet.

Quantitative Analysis

Questions relating to technological efficacy (TE) and Internet engagement attitudes (IEA) were tested to assess Q2. Spearman correlations between the two sets of questions are presented in Table 1. Subsequent analyses were conducted after data cleanup. The final sample size was $n = 100$. Most of the correlations are statistically significant and demonstrate what would be considered a medium effect size (Thompson, 2002). Individuals who reported a stronger reliance on Internet resources to help them deal with unforeseen circumstances (TE1) attempt to have more opportunities in life through the use of a computer (IEA1). Similarly, there was also a higher correlation for people who use computers to improve their lives (TE4) and seeking more opportunities through the use of technologies (IEA1). Individuals reporting high in items TE1 and TE4 were also more likely to report using the Internet as an informational source that can help them make sense of the world.

Subsequently, correlations were produced between Internet engagement attitude responses and sets of questions relating to political engagement (PE) for Q1. Most Internet engagement attitude variables tend to impact political engagement with the exception of PE1 and PE5. In

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[4]Inclusion Agents are the people responsible for taking care of each telecenter, promoting computer-related workshop and classes and help the users.

TABLE 3. Spearman correlation table for the set of questions relating to digital freedom (F) and political engagement (PE).

	F1	F2
F2	.40***	
PE1	.21*	.27**
PE2	.05	.22*
PE3	.23*	.22*
PE4	−.05	−.05
PE5	.35***	.44***

Note. Significance levels: $*p < .05; **p < .01; ***p < .001$.

TABLE 4. Spearman correlation table for the set of questions relating to content creation (CC) and political engagement (PE).

	CC1	CC2
CC2	.35***	
PE1	.01	.32**
PE2	.31**	.24*
PE3	.16	.28**
PE4	.10	.14
PE5	.18	.25**

Note. Significance levels: $*p < .05; **p < .01; ***p < .001$.

particular, PE5 is a question referring to participation in the 2013 protests specifically, and there are no statistically significant correlations because, as described before, the organizers of the protests, who were mainly from the upper classes, did not invite or include people from the lower classes in any of the protests. Responses for PE5 were largely skewed towards nonparticipation in recent protests at the time of the survey. Furthermore, people who utilized the Internet as a source of information and empowering tool (IEA1, IEA2, and IEA3) have a higher participate rate in online political and social movements (PE2), share more information about political events (PE3), and assist others more through the web (PE4) (Table 2).

Mobile Internet did seem to correlate with participation in recent protests at the time ($r_s = .23$, $p < .05$), as well as actively sharing political information online ($r_s = .25$, $p < .05$). There was also a nonsignificant result regarding participation in online protests that was nevertheless considerable ($r_s = .18$, $p < .10$). These results seem to partially confirm Q3 and suggest that mobile Internet is associated with political engagement, both online as well as offline.

Table 3 shows the correlations between the set of questions relating to political engagement and digital freedom (F1 and F2) for Q4. Statistically significant correlations were found for PE1, PE3, and PE5, suggesting that a self-perceived freedom is associated with political engagement. In particular, those feeling freer on the Internet tend to share more about social and political issues online (PE3), participate more in volunteer activities online (PE1), and also participated in the protests that took place prior to when the survey took place (PE5). Furthermore,

respondents who have experienced prejudice online also tend to rate the aforementioned items higher. This does not necessarily imply causation but, rather, that respondents who are politically active online also tend to encounter opposing views.

Correlations were also constructed between the variables that measure content creation (CC1 and CC2) and political engagement relating to Q5. These correlations are shown in Table 4. While both blog or personal page creation and participation in wikis were found to be associated with at least one of the political engagement variables, participation in Wikipedia content creation (CC2) appears to have a higher correlation with political engagement.

Structured Modeling

To identify the larger picture obtained by these results, we constructed a structured equation model based on our variables and research questions. This was built upon the theoretical model presented in Figure 2. The method that we used was the partial least squares (PLS) path modeling (PM) provided by the R package plspm (Sanchez, 2013). The method allowed for the creation of latent variables based on formative as well as reflective indicator variables.

Latent variables were created not only to minimize the measurement error of these broad topics but also to measure the conceptual terms of this research, as many of the questions measure aspects of a particular theme. Latent construction was formulated based on research questions and concepts, as well as by utilizing exploratory factor analysis. Variables relating to political engagement (PE1, PE2, PE3, PE4, PE5) as well as content creation attitudes (CC1, CC2) were utilized as reflective indicators based on literature criteria (Petter, Straub, & Rai, 2007). The same approach was utilized to identify the formative indicator variables for the latent variables relating to technological efficacy (TE1, TE3, TE4), digital freedom (F1, F2), Internet engagement attitudes (IEA1, IEA2, IEA3), and Internet access (mobile Internet). Figure 2 shows the PLS model result that was constructed based on our hypothesized model.

Almost all variables loaded onto a latent variable with the only exception being PE4, PE5, and TE2, which did not fit the model. A summary of reliability tests for both reflective and formative latent indicators is provided in Table 5. Reflective indicators were evaluated based on their unidimensionality. Cronbach's alphas were high with content creation, showing scores above .5 but below .7. However, Cronbach's alpha is prone to producing erroneous results and it is not considered as robust a method as other alternative measures that control for unidimensionality (Vinzi, Trinchera, & Amato, 2010). We triangulated unidimensionality results with two additional metrics, Dillon-Goldstein's rho and average variance extracted. Dillon-Goldstein's rho was above .7, which is a desired outcome. Average variance extracted scores were also high for both reflective latent variables.
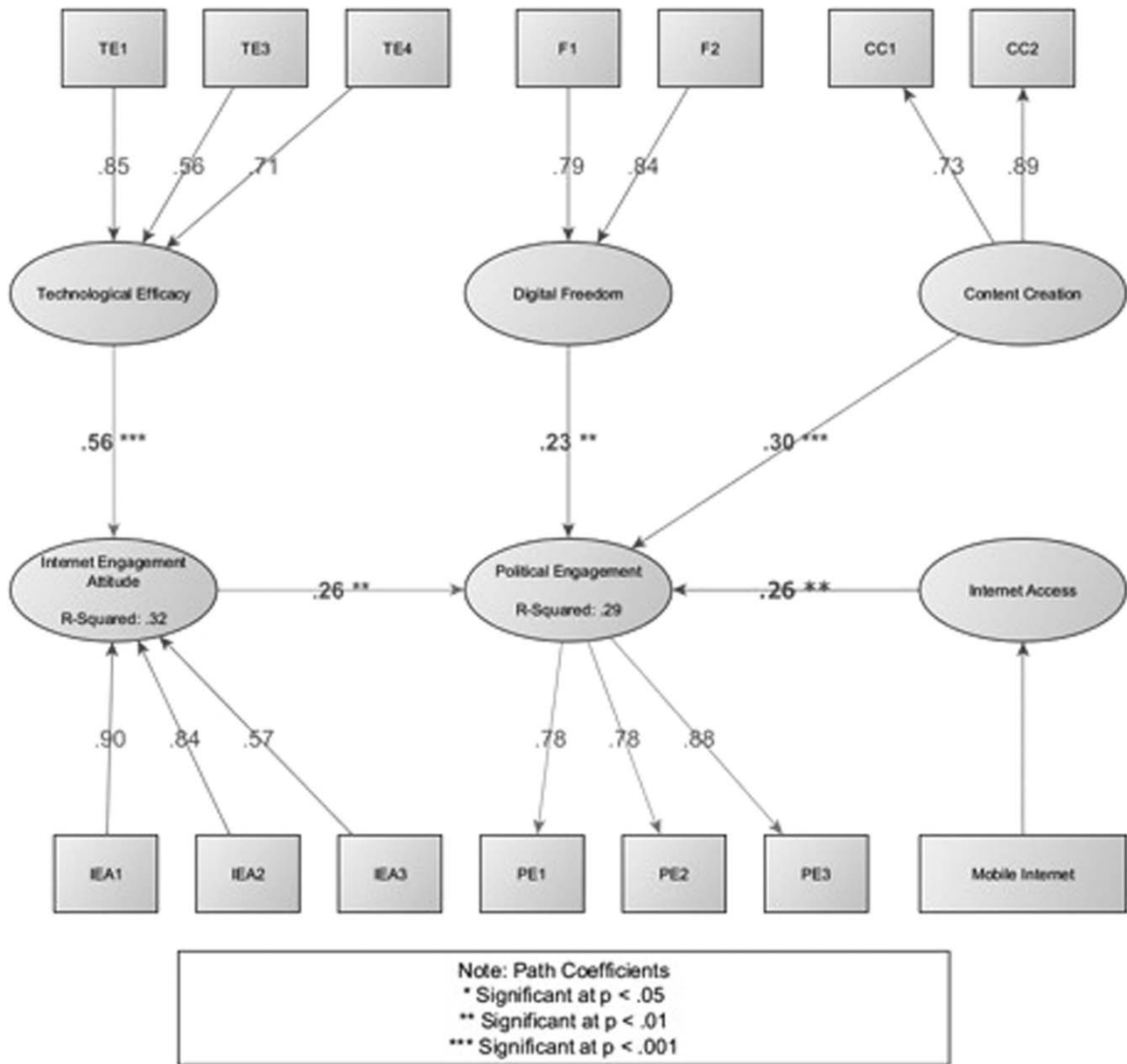
FIG. 2. PLS structure equation modeling of variables tested for the hypothetical model in this study. Latent variables were created based on survey questions relating to Internet engagement attitudes (IEA), political engagement (PE), content creation (CC), technological efficacy (TE), digital freedom (F), and Internet access.

Formative latent variables were expected to have a relative high degree of correlation between their model variables. However, because model variables represent concepts that are not entirely similar, correlations should not be large. Loadings for all formative indicators were above .7. An inspection of cross-loadings confirmed that the selection of latent variables and indicators was correct. The results indicated that all items loaded on their latent variable above .7 and they rated more highly on their respective latent variable than on any other. Collinearity based on the *mtmm* function provided by the package *psy* in programming language R, also verified the fit of model variables within their respective formative latent variable. These variables are shown in Table 5 under convergent validity. Variance inflation factor

is also below 5, which is a good indication that model variables are not highly correlated. Finally, all loadings are above .5 for model variables. The overall goodness-of-fit for the model is 43.2%.

All variables included in the model are statistically significant. As previously observed with the correlation testing, technological efficacy has a large impact on Internet engagement attitude. In turn, Internet engagement attitude is confirmed to have an impact on political engagement. Similarly, digital freedom appears to contribute to political engagement. The highest predictor of political engagement appears to be content creation, while digital freedom appears to have the lowest association. However, all predictor variables for political engagement appear to have standardized

TABLE 5. Reliability metrics for latent variables: content creation (CC), political engagement (PE), technology efficacy (TE), digital freedom (DF), Internet engagement attitude (IEA).

	MVs	AL	Rho	AVE	CV	VIF	Ls
Reflective							
CC	2	.511	.803	.665	-	-	-
PE	3	.749	.857	.664	-	-	-
Formative							
TE	4	-	-	-	.288-.476	1.07	.565-.847
DF	2	-	-	-	.328	-	.788-.839
IEA	3	-	-	-	.467-.612	1.26	.577-.896

Note. Number of model variables (MVs) is presented for each latent variable.

Reliability indicators for reflective latent variables: Cronbach's alpha (AL), Dillon-goldstein's rho (rho) and average variance extracted (AVE). reliability indicators for formative latent variables: convergent validity (CV), variance inflation factor (VIF) and loadings (ls).

scores that are numerically high. Additional covariances between variables were tested but none produced statistically significant results nor overall improvement in the model.

Qualitative Findings

Additional open-ended questions were included in the survey to gauge the behavioral aspects of respondents that cannot be otherwise extracted by quantitative or categorical responses. Findings are presented in this section.

Although most individuals reported accessing Internet applications through the telecenters, many also reported alternative locations in which they access the Internet and social media. Approximately 18% of respondents reported accessing the Internet through their mobile phones or tablets; however, the vast majority used the Internet provided by the telecenters (open telecenter WiFi hotspots). Although their mobile phones were Internet-enabled, they could not afford a data plan from cellphone carriers, once again relying on the Internet provided by the CTCs. Less than 20% reported accessing the Internet through their home; however, some reported accessing it through their parents' home.

Those who used mobile Internet reported that they did so due to its mobility, speed, and convenience. Those with a preference for telecenters reported that it was due to the center's proximity to home, speed, better equipment, being accustomed to using a computer, as opposed to a mobile phone, and the fact that the services were free. This is indicative of the reality that poor communities do not usually have equipment that performs well with Internet applications nor have the technology efficacy skills that can help them utilize mobile applications, as reported by Nemer (2013b).

Finally, one of the questions included in the survey referred to participation during the protests that happened in Vitória in June of 2013. Less than one third of the respondents actually participated in the demonstrations. Of those who did, most reported finding out about the demonstrations through television. This finding follows our claim that the poor were not "invited" to the protests because they were

organized by the middle class through social media. Because different social classes did not overlap either offline or online, the word about the protests never reached those from the lower classes. Most of the poor became aware of the protests through mass media channels, such as TV.

Discussion

The research questions in this study have all been confirmed based on the analyses performed. However, while most of them affect our dependent latent variable (political engagement) to a substantial degree, some are more important than others.

Content creation contributed to political engagement to a substantial degree (Q5). This is likely due to the increased engagement of individuals that transforms them from simple content consumers to content creators. Content creators are the users most engaged with social media, as user-generated content is inherent to the definition of social media (Kaplan & Haenlein, 2010). Social media can be classified based on the degree of media richness, with services focusing on text rating on the low end of the scale and those utilizing video and audio rating higher. This study focused on content creation in the types of social media that include the least media richness (mainly text as opposed to videos or photos). This was performed by design because it was expected that many individuals will have to utilize applications that require less bandwidth. Of the few individuals who happened to be content creators, political engagement was high. However, correlation results indicate that not all content creation activities are equal. Bloggers (people who responded to the Likert scale items 4 and 5 on CC1) are less likely to engage in political activities (CE2 responses, M = 2.11, SD = 1.8) while Wikipedia contributors (people who responded to the Likert scale items 4 and 5 on CC2) have a stronger impact on political engagement (CE2 responses, M = 2.9, SD = 2.02). This could potentially be attributed to the differences in design of the two social media applications. Blogs allow for self-representation, whereas Wikipedia (as with other Wiki software applications) is mainly a task-oriented application. Blogs also lack interactivity with respect to information because they are often created by a single or few authors who write about a particular topic. Wikipedia invites individuals to engage with ideas from larger crowds, and authorship of content is more collaborative. Such communities are found to be ideal for cooperation as well as for collective action. In contrast, social networking sites, in particular small networks, while important for sharing information, are not seen as contributors to collective action (Howard, 2010). However, open-ended questions do seem to suggest that Facebook was a primary source for many individuals who participated in the 2013 protests, suggesting that, while small groups may be highly active in terms of political engagement, sharing networks invite an immediate response to protests that otherwise may not have spread very widely.

Another important factor that plays an important role in political engagement is technology engagement attitude (Q1). This factor is influenced by technology efficacy (Q2). Overall, users who have the confidence to attempt and resolve new previously unseen tasks with technology will be more eager to use technology as an assistive tool in their daily lives. These individuals appear to have a higher impact on political engagement. This finding demonstrates that engagement attitudes in relation to technology are produced by one's technological efficacy. The results suggest that once confidence with technology is gained, people appear to be more active citizens. The impact of these results could echo a new government strategy that would like marginalized populations to be more engaged in political matters. However, this is not always the case because governments such as Egypt (see Tufekci & Wilson, 2012) and the US (see Landau, 2013) have taken measures to monitor, spy, and limit citizen engagements through technology. Further, it shows that telecenters alone cannot be seen as the solution. Training programs will need to work in tandem to develop technology efficacy skills for individuals.

Mobile Internet also appeared to have a statistically significant influence on political engagement (Q3). This could be attributed to the immediacy potential inherent in mobile devices. Individuals who have mobile Internet are more connected to others and to events around them that would otherwise be difficult to become aware of. The geographical nature of favelas is restrictive in terms of physical access to telecenters because particular areas cannot be safely traveled through at all hours of the day due to drug cartel activity (Nemer & Freeman, 2015). Furthermore, telecenters only open from 8 AM to 6 PM, Monday through Friday. Individuals without mobile Internet are likely to be deprived of the connectedness afforded by social media and the Internet for long periods of time. Furthermore, mobile Internet users can engage and easily communicate with other favela residents.

Finally, digital freedom as a perceived value has been found to be gaining in significance. Ethnographic research has found that these individuals feel that they are being monitored while online by the gang cartels (Nemer & Freeman, 2015). Gang cartel leaders have also confirmed that they monitor Facebook accounts of people who live in favelas and that they would like to have more access to data of favela residents. Many favela residents have reported that they have a better freedom of expression online than offline. While expression can also be influenced by spiral silence theory (Gearhart & Zhang, 2015), these findings still highlight the influence that a sense of online freedom can have on political movements. That feeling of having an added freedom is likely to have an impact on people attempting to be more politically active.

Recommendations

Our findings have direct implications for both favela users as well as people involved in activating political engagement for these marginalized groups.

Individuals who reside in favelas can empower themselves by taking steps to improve their technology skills, acquiring mobile Internet and engaging more in content creation, be it encyclopedia writing or even video production (Nemer, 2015a; Nemer & Freeman, 2015). Understandably, all these steps are not easily attainable for people in marginalized communities who often do not have the economic or social capabilities to achieve these goals. However, should opportunities arise, people have an individual responsibility to become more civically active in societal matters that directly affect them. One of these areas of empowerment can be found in Internet use and security practices that individuals undertake while online. Some of the respondents in the survey were found to also access the Internet through their cellphone using the wireless Internet provided by telecenters. For some areas, this may be used as a backup to poor cellphone signal. However, wireless Internet is open and encrypted. Residents who use wireless Internet without common security practices, such as using secure HTTP protocols for accessing pages, may leave themselves vulnerable to gang cartels that can monitor their traffic. As security issues are constant and ever-changing, protecting one's browsing history should be an individual responsibility as much as a responsibility of software companies and the state. Frequent access to the wealth of information that the Internet and social media provide may be the first step in alleviating this issue and producing more engaged citizens.

The findings of this study can be used by organizations as well as the state in its attempt to empower marginalized communities to achieve higher political engagement. Implementing telecenters may add to the potential for political engagement; however, this study has shown that training individuals to gain technology efficacy, providing them with more immediate mobile access to the Internet, and generating opportunities for content creation can all contribute to higher political engagement. Addressing these issues requires a coordinated plan, one that is also particularly focused on providing individuals with competence when dealing with technology, as opposed to other types of skills. This type of training should be treated as a lifelong commitment to learning rather than a one-time training course.

Furthermore, in one of the questions of the survey, participants were asked whether they wished that everything on the Internet were in Portuguese. Approximately 65% of survey participants responded along the strongest part of the Likert scale, and ~25% responded along the lowest level. This demonstrates a split between the better-educated part of the population, which has an easier time traversing the Internet (even though many aspects are in English), and others who appear to be struggling with the language barrier. Most of the popular applications that these individuals use online are already in Portuguese. Their request for content on the Internet may refer to user-generated content. As such, when designing social media platforms, developers need to provide the ability to translate non-native text by means of translation software. Oftentimes, social media platforms do not provide such an option. Future research should

investigate the nature of the language barrier faced by these populations and identify design and policy aspects that can help to improve that barrier.

Limitations

The findings in this study have revealed technology-related factors that influence political engagement in marginalized communities. These factors are restricted to the study's population of interest, which includes the individuals who interact with technology within the favelas. As such, the recommendations and findings in this study relate to what would be considered an effective strategy to implement telecenters and provide community training to enhance political engagement. However, the study is limited to exploring ways to help marginalized groups in favelas engage with technology for the first time. As such, it should be taken into account that the recommendations in this study should not be treated as a silver bullet meant for all individuals in favelas. Additional limitations are also based on the sample size, where behaviors may be underrepresented in certain categories. For example, only 17% of respondents selected item 4 or 5 for CC1, and 10% of respondents selected item 4 or 5 for CC2. Finally, the study and findings in this paper focused on quantitative aspects of how digital engagement affects political engagement. There are several questions that resulted from the findings that cannot be answered by using the aforementioned data; a qualitative case-by-case study may be necessary to address these issues.

Conclusion

Political engagement is an inalienable right of all citizens that is deeply engraved in the heart of democracies. Thus, just as citizens have the right to be protected by the state, the right to certain benefits and services, and the right to engage in the various modes of determining the practice and outcome of governance, these rights also extend to the digital sphere, granting the same protections, services, and rights to political participation (Gurstein, 2015). However, people who experience the consequences of digital inequalities often see their rights as citizens diminished due to their limited political engagement via ICTs. In this paper we analyzed different sociotechnical factors that may play a role in promoting political engagement of marginalized communities, such as those living in favelas. We showed that online content creation, digital freedom, and access to mobile Internet may positively impact political engagement. Thus, fomenting these factors may not only promote the inclusion of marginalized populations in future political events but also help build a more equal society where everyone's voice has a chance to be heard.

In this paper, we also join Gurstein (2015) in going beyond the current discussions on ICTs and political engagement (Earl & Kimport, 2011; Mossberger et al., 2007), which focus on defining the nature of citizenship in a digital age. Their concerns, as important as they are, focus on how conventional citizenship is supplemented and enabled by the digital sphere. This paper expands this notion by suggesting that ICTs, in transforming other aspects of conventional life, are also transforming our political engagement. Therefore, citizens should also be guaranteed other rights, such as Internet access, at a speed and quality that is sufficient for active and effective citizenship, as well as the necessary digital literacy to make effective use of this tool in support of effective digital citizenship. Under this framework, rather than a society with unbridgeable digital and social divides, we can look forward to a society whose citizens have certain digital rights that are guaranteed by the State and that ensure digital access, necessary training, and other tools that ensure the opportunity to exercise those rights.

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Appendix

1. Sex (Male/Female)
2. Age
   __0–17
   __18–29
   __30–49
   __50–69
3. Where do you access the Internet more often?
   __Telecenter
   __Cell Phone (or Tablet)
   __Home
   __LAN House
   __Other [Open ended question]
4. Where else do you use Internet?
   __Telecenter
   __Cell Phone (or Tablet)
   __Home
   __Parent's Home
   __LAN House
   __Other [Open ended question]
5. Do you have a cellphone? (Yes/No)
6. If yes, do you have mobile Internet (cellphone Internet)? (Yes/No)
7. Which mobile Internet do you prefer? (Telecenter/Cell Provider).
8. Why? [Open-ended question]
9. If you participated in the 2013 protests, how did you hear about them? (television, radio, newspaper, Facebook) [Open-ended question]

   Responses to the items below were collected on a 5-point Likert scale adapted to the speech patterns of the local population, where 1 = *No* and 5 = *For sure*.

Digital Freedom

1. You feel more free on the Internet than in real life.
2. You've suffered prejudice online because of your social and/or racial condition.

Internet Engagement Attitudes

1. You try to have more opportunities in life through a computer.
2. You try to use the Internet to help you make sense of the world.
3. You're looking to learn about the different experiences and sides of the Internet.

Technology Efficacy

1. Internet resources help you deal with unforeseen situations.
2. When you have a question, you look for answers on the internet.
3. The internet helps you solve problems.
4. You can use computers to improve your life

Content Creation

1. You have personal website or blog.
2. You've contributed to Wikipedia or another wiki on the Internet.

Political Engagement

1. You participate in volunteer activities through the Internet.
2. You participate in political or social movements online.
3. You share information about political issues/politics over the Internet.
4. You find ways to help others through the Internet.
5. You participated in the protests that recently took place.