

Revisiting the Relationship Between Internet Access and Civic Engagement: A Multilevel Analysis of Between-Country Differences and Within-Country Change

RUTH JIN-HEE HEO*
TAI-QUAN "WINSON" PENG
Michigan State University, USA

Despite the increasing prevalence of Internet connectivity, a significant portion of the population in developing and underdeveloped countries still lacks access to the web. This raises questions about whether there are distinct national disparities in the relationship between Internet access and civic engagement. To address this question, this study employs a multilevel research approach and utilizes extensive cross-country longitudinal survey data. It aims to reexamine the connection between Internet access and civic engagement, while also exploring potential variations across countries. Findings indicate that individual Internet access, as well as factors such as community action context and life satisfaction, are positively associated with civic engagement when accounting for economic and political factors at the national level. Additionally, this study underscores the significant role of country-level indicators in civic engagement and delves into further detail about the interaction effects among the variables at different levels.

Keywords: civic engagement, Democracy Index, community action context, Internet access, life satisfaction, gross domestic product

Internet access has become an essential human right in our day-to-day lives (Reglitz, 2020). The Internet enables people to, for instance, promote, defend, and share informational resources, thereby supporting freedom of expression, freedom of information, and freedom of assembly (Reglitz, 2020). Additionally, many empirical studies have shown that the Internet enlightens individuals' civic lives, as it enables them to access information and improve their social connections while strengthening their feelings of social trust, which in turn leads them to become increasingly civically involved (e.g., Boulianne, 2009; Jennings & Zeitner, 2003; Shah, Cho, Eveland, & Kwak, 2005; Wellman, Haase, Witte, & Hampton, 2001; Xenos & Moy, 2007).

Despite the well-documented positive impact of the Internet on civic life, however, there also exists a good deal of disparity about universal Internet availability and accessibility. Despite the Internet's growing integration into daily life for many, Internet access inequality persists as a prominent global social issue. As

Ruth Jin-Hee Heo: ruthheo25@gmail.com

Tai-Quan "Winson" Peng: pengtaiq@msu.edu

Date submitted: 2023-03-16

Copyright © 2024 (Ruth Jin-Hee Heo and Tai-Quan "Winson" Peng). Licensed under the Creative Commons Attribution Non-commercial No Derivatives (by-nc-nd). Available at <http://ijoc.org>.

of the end of 2020, nearly half of the world's population still lacked Internet access (International Telecommunication Union [ITU], 2020). Consequently, scholars have extensively studied the digital divide and knowledge gaps stemming from Internet inaccessibility (Dimaggio & Hargittai, 2001; Martin & Robinson, 2007), but there is still a limited understanding of how the relationship between Internet access and civic engagement evolves over time and varies across different societies.

In addition to evaluating the association between Internet access and civic engagement across different countries, this study aimed to discern variations at both the individual and country levels. While previous research has often included individual-level factors, such as education, political interest, and media use when examining the direct impact of the Internet on civic and political engagement (Boulianne, 2009), this study additionally focuses on individual-level variables closely intertwined with civic engagement, such as social trust, interaction, and connections (e.g., life satisfaction and community action context). These variables have often been omitted or only partially explored in the existing literature. Moreover, the study acknowledges the significance of country-level factors tied to the socioeconomic landscape of nations, such as the state of democracy and gross domestic product (GDP), in potentially relating to the level of civic participation (Jagers & Gurr, 1995; Schofer & Gourcade-Gourinchas, 2001). The study also examines the relationship between civic engagement and these country-level factors. It is worth noting that their relationships are likely to evolve over time, and the relationship between Internet access and civic engagement may also be enhanced or attenuated by a nation's political and economic system. Hence, the study also explores potential interaction effects to provide a comprehensive understanding of this complex relationship. By incorporating variables at different levels associated with civic engagement, an integrated model will be constructed, summarizing the findings of previous studies.

In the present study, we reexamine the connection between Internet access and civic engagement using extensive cross-country longitudinal survey data spanning 2006 to 2020. While Internet access can be conceptualized as multidimensional, this study focuses on its unidimensional aspect; specifically, it explores Internet penetration rather than other dimensions such as quality, ubiquity, and autonomy (Helsper, 2021). Going beyond Internet access alone, we incorporate a wide range of individual- and country-level factors to provide a more comprehensive understanding of the factors associated with civic behaviors among individuals. To explore this complex relationship, our study employs a multilevel research design, allowing us to investigate both within-country changes and between-country variations in civic engagement. Hence, while controlling for systematic variations, we seek to examine how Internet access interacts with other factors and how those factors jointly relate to civic engagement.

Literature Review and Research Hypothesis

The Role of Individual-Level Characteristics in Civic Engagement

Internet Access and Civic Engagement

The rise of the Internet has not only granted individuals access to a wealth of information but has also allowed individuals to transcend geographical barriers, enabling social connections regardless of physical distance. In essence, the Internet enriches both informational resources and social capital,

empowering people to actively participate in civic activities. During the early days of Internet research, the focus primarily centered on Internet access, which was limited to a select few. Scholars discovered that restricted Internet access gave rise to an information gap, depriving some individuals of valuable information that could enhance their economic, educational, and social prospects—a phenomenon referred to as the first-level digital divide (Helsper, 2021; van Deursen & van Dijk, 2014). Studies identified that Internet access was inequitable, largely because of socioeconomic status and disparities in the rural-urban network infrastructure (Ahmed, Cho, Jaidka, Eichstaedt, & Ungar, 2020; Dimaggio & Hargittai, 2001; Martin & Robinson, 2007). As Internet adoption gradually spread over time, unequal access exacerbated existing social inequalities, as easy access to information enabled the affluent to prosper, while the less privileged sank further into poverty (Dimaggio & Hargittai, 2001; Martin & Robinson, 2007).

When researchers explored the effects of Internet access in the early 2000s, the global Internet penetration rate was around 10% (ITU, 2015). By 2019, this rate had surged to 51% (ITU, 2020). Notably, in the United States, a developed country, approximately 90% of adults reported Internet usage, far surpassing the global average (Pew Research Center, 2021). However, in countries like Chad, which is still developing, only 18% reported Internet usage (The World Bank, n.d.). Given the global increase in Internet penetration rates, it is presumable that universal Internet access and high connectivity have improved compared with a decade ago. This is supported by a recent study that confirmed the positive influence of Internet access on civic engagement across 108 countries (Ahmed et al., 2020). Nevertheless, the digital divide driven by unequal Internet access persists globally and continues to warrant attention (Ahmed et al., 2020).

As the overall rate of Internet penetration rises, some scholars emphasize the importance of understanding the nature of Internet usage; van Deursen and van Dijk argue, for instance, that there is a second-level digital divide—that specific types of Internet use contribute to disparities in individuals' social and personal well-being (van Deursen & van Dijk, 2014). Consequently, numerous researchers have focused on different types of Internet use and examined their social consequences on civic participation (Shah, Kwak, & Holbert, 2001; Shah, McLeod, & Yoon, 2001; Shah et al., 2005). Regardless of the measures used to assess Internet use, such as time spent, the comparison between Internet users and nonusers, and types of Internet use, research has demonstrated a positive impact of the Internet on civic engagement overall (Boulianne, 2009).¹

In investigating a new media context where social media use has become a dominant Internet service, scholars have reported a positive influence of social media use on civic participatory behavior (Boulianne, 2020; Gil De Zúñiga, Jung, & Valenzuela, 2014; Skoric, Zhu, Goh, & Pang, 2016). Studies have also assessed the impact of limited Internet access exclusively via mobile devices (as opposed to home Internet access) on the extent of one's social or civic engagement (Fierro, Aroca, & Navia, 2020; Kahn, Welsler, Cisneros, Manatong, & Idris, 2020). Despite the wide range of modalities and degrees of Internet

¹ Although we sometimes refer to the impact of the Internet on civic engagement from the previous research, we do not imply the technology deterministic view here. We chose the word "the impact of the Internet" to incorporate the concepts stemming from the Internet, such as Internet use, Internet access, which have been defined variably in different studies.

access, however, such research has underscored the essence of Internet access, which has brought about positive social and civic changes.

The primary objective of this study is to examine the possible worldwide role of Internet access, as distinct from its usage, on individuals' social behaviors, specifically civic engagement. Additionally, the research aims to chart the evolving relationship between Internet access and civic engagement over time. Building on earlier research findings, it is hypothesized that Internet access is likely to augment social interactions and facilitate access to informational resources, thereby increasing individuals' propensity to engage in civic activities (Boulianne 2009; Jennings & Zeitner, 2003; Shah et al., 2005; Wellman et al., 2001; Xenos & Moy, 2007). While prior studies predominantly focused on the United States population, with examinations of the digital divide largely confined to North America, our study extends its scope to encompass a global perspective. By broadening our research to encompass the global population, we shift our attention toward variations within individual countries, while simultaneously controlling for differences across countries. In doing so, we aim to offer a comprehensive understanding of the relationship between Internet access and civic engagement, thus testing the proposed hypotheses on a global scale.

H1: Internet access is positively associated with civic engagement.

When assessing the trend of the relationship over time, it becomes evident that individuals are increasingly prone to engage in social interactions and discussions of their opinions, which, in turn, heighten their civic engagement (Shah, Kwak, & Holbert, 2001; Shah et al., 2005). A recent meta-analysis, for instance, has highlighted that the impact of digital media use on both civic and political participation has increased over the last 20 years (Boulianne, 2020). Research has also found that Internet use has had indirect and direct effects on civic participation, consistent over time (Shah et al., 2005). Such results demonstrate the sequential effect derived from digital media, which further generalizes to the influence of the Internet. Over the years, the increased use of social media, specifically stemming from increased Internet access, has enabled people to use such platforms to express and promote their civic activities. However, this aspect has remained largely unexplored in the previous literature. Therefore, the current study is positioned to investigate how the relationship between Internet access and civic engagement evolves over time.

RQ 1: How does the association between Internet access and civic engagement change over time?

Life Satisfaction and Civic Engagement

The close relationship between social trust and civic engagement constitutes a fundamental element of community life, enabling citizens to address and solve problems collectively (Putnam, 1995). However, the foundation for establishing social trust is rooted in individual-level contentment, specifically how satisfied people are with their own lives and the extent to which they perceive satisfaction (Brehm & Rahn, 1997; Crowley & Walsh, 2021; Shah, Kwak, & Holbert, 2001). This construct not only encompasses general emotional predispositions but also has implications for democratic stability (Brehm & Rahn, 1997). In the context of civic culture, the motivations driving an individual's civic-oriented behavior collectively

relate to their overall sense of satisfaction. Life satisfaction serves as an integrative measure of one's psychological, social, and behavioral well-being.

About low life satisfaction, DeNeve and Cooper's (1998) meta-analysis revealed that it is closely tied to one's levels of emotional stability, self-efficacy, and self-esteem. Furthermore, Park (2004) found that low life satisfaction correlates with a range of psychological, social, and behavioral issues, inhibiting individuals' ability to adapt to adversity. Conversely, individuals with high levels of life satisfaction tend to exhibit greater resilience in the face of challenges. Rather than becoming frustrated and stagnant, they are more adept at coping and moving forward. Moreover, heightened life satisfaction contributes to increased social interaction and trust, indirectly fostering civic engagement (Brehm & Rahn, 1997; Shah, Kwak, & Holbert, 2001). Additionally, Scheufele and Shah (2000) reported a positive association among interpersonal trust, life satisfaction, and civic engagement. Based on these observations, we propose the following hypothesis:

H2: The perception of life satisfaction is positively associated with civic engagement.

Communication Action Context and Civic Engagement

Communication action context (CAC) refers to the communal environment in which individuals reside, exerting a significant influence on their level of civic engagement within those communities (Ball-Rokeach, Kim, & Matei, 2001). The social landscape of communities can either foster or hinder social participation, depending on whether the community is open or closed. Open communities, characterized by higher ethnic diversity, often encourage volunteerism and active civic involvement. Conversely, closed communities tend to have less diversity and lower levels of community engagement. These community characteristics are relatively ingrained, shaping the behaviors of most community members in their day-to-day lives (Ball-Rokeach et al., 2001). Numerous studies (e.g., Ball-Rokeach et al., 2001; Grillo, Teixeira, & Wilson, 2010; Kim & Ball-Rokeach, 2006; Shah, McLeod, & Yoon, 2001) have demonstrated how CAC influences an individual's level of civic engagement, even across different cultural contexts, as originally posited by Ball-Rokeach et al. (2001).

In the early stages of researching CAC, Ball-Rokeach et al. (2001) explained that CAC encompasses physical, psychological, economic, and technical dimensions. Subsequent studies expanded on this concept, offering more concrete conceptualizations of CAC, which typically included physical/spatial, social, and economic features in line with the specific goals of their research (e.g., de Souza Briggs, 2008; Kim, Kim, & Chae, 2022; Sampson, 2012; Zhang, Motta, & Georgiou, 2018). For instance, Shah, McLeod, and Yoon (2001) extended their exploration of structural factors to the community level by examining elements like institutional confidence, social connectedness, and community stability. This shift in perspective regarded CAC as a relational type of social setting, emphasizing the community's role in shaping individuals' social environments and, consequently, their engagement in civic activities. This expansion of variables underscores the diverse contextual factors that define communities, ultimately affecting people's propensity to participate in civic activities.

H3: The perception of CAC is positively correlated with civic engagement.

The Role of Country-Level Characteristics in Civic Engagement

Democracy Index

This study introduces the Democracy Index as a country-level factor that modifies individuals' civic behaviors. The Democracy Index measures the degree to which a country has embraced democratic principles. Regardless of the varied conceptualizations of democracy, a common thread is the emphasis on citizens' participation (Stadelmann-Steffen & Freitag, 2011). Different nations adopt democratic models that shape citizen participation patterns, which are often rooted in their state ideologies. These ideologies, in turn, provide individuals with varying degrees of civic engagement options based on country-specific characteristics and structures. In essence, individuals make decisions about their levels of civic engagement within the political and societal contexts in which they reside (Jaggers & Gurr, 1995). For example, a comparative study by Putnam, Leonardi, and Nanetti (1992) explored the relationship between political development and civic engagement in North and South Italy. South Italy, known for its lower institutional development and fewer formal and informal social organizations supporting civic involvement, exhibited lower levels of civic activity compared with North Italy. Additionally, Oxendine et al. (2007) found that political and structural contexts, including external forces imposed by local or federal governments, influenced information technology adoption (e.g., Internet use) among local citizens. Therefore, nations play a crucial role in shaping political freedom and defining the rules that govern civic behavior. Within the contextual framework of democracy, individuals tend to exhibit higher levels of civic engagement.

H4: Democracy Index is positively correlated with civic engagement.

Traditionally, democracy has been considered a constant and unchanging identity that characterizes a country. Scholars like Dahl (2005) have regarded countries as the standard units for practicing democracy, where citizens drive government decision making processes. In theory, democratic practices are expected to be internalized and reinforced among citizens over time, leading to the prevalence of politically charged behaviors. However, predicting the exact direction and strength of this relationship remains challenging. Given these complexities, this study raises a research question for further exploration.

RQ2: How does the association between the Democracy Index and civic engagement evolve?

Gross Domestic Product

The second country-level factor under consideration is the GDP, an indicator that assesses the wealth and affluence of a society and its connection to civic engagement and active participation in the community (Almond & Verba, 1963; Brehm & Rahn, 1997; Curtis, Baer, & Grabb, 2001; Gundelach, 2016). Generally, higher societal wealth is associated with improved education, increased leisure time, and various individual-level characteristics that tend to foster participation in civic organizations. The economic prosperity of a nation provides collective resources that can bolster social activities and support civic engagement initiatives (Schofer & Gourcade-Gourinchas, 2001). Therefore, in societies with higher GDPs, individuals are likely to be more inclined, or more able, to participate voluntarily in civic activities.

H5: GDP is positively associated with civic engagement.

However, it is worth noting that GDP is typically an aggregate measure that summarizes a society's wealth on an annual basis. The annual percentage change in real GDP growth exhibited a fluctuating trend globally from 2006 to 2020 (International Monetary Fund, n.d.). Given this variability in global GDP growth over time, predicting the precise relationship between GDP and civic engagement over extended periods can be challenging. To address this uncertainty, this study poses a third research question that explores the changing dynamics of this relationship.

RQ3: How does the association between GDP and civic engagement evolve over time?

Interaction Effects of Internet Access and Country-Level Factors

The impact of the Internet on civic mobilization has also been examined across countries (e.g., Gainous, Wagner, & Abbott, 2015; Lee, 2017; Wagner & Gainous, 2013). Because of the varying economic or political aspects about how countries use the Internet in connection with civic participation, each nation is likely to impose a distinct feature on the linear relationship (Gainous et al., 2015). Past studies have largely conducted cross-national comparisons by targeting countries in a specific region, such as East Asia or the Middle East (e.g., Gainous et al., 2015; Lee, 2017; Wagner & Gainous, 2013). The varying relationship between Internet access/use and civic engagement was attributed to regional characteristics, reinforcing the contextual issues manifested in citizens' participation. Therefore, it remains unclear how to delineate the comprehensive trend in the effect of the Internet on civic engagement across countries encompassing various regions and how the relationship would vary by country-level variables, such as the Democracy Index or GDP. To provide a complete demonstration of the posited relationship, countries in various regions must be included (cf. Boulianne, 2020). Moreover, political and economic factors should be considered to explain the idiosyncrasies of each country. The current study aims to incorporate countries across six continents (excluding Antarctica) and examine their economic and political measures to more comprehensively identify the varying relationships between Internet access and civic engagement across countries.

RQ4: Will the association between Internet access and civic engagement be moderated by a country's Democracy Index?

RQ5: Will the association between Internet access and civic engagement be moderated by a country's GDP?

Research Method

The data for the study came from Gallup's World Poll data from 2006 to 2020. Gallup conducts annual surveys across countries, representing more than 99% of the world's adult population, using randomly selected, nationally representative samples. Gallup typically surveys 1,000 individuals in each country using a standard set of core questions that have been translated into the major languages of the respective country. The poll primarily focused on evaluating infrastructure, civic engagement, and well-being. The original data set incorporated 160 countries, although only data from 40 countries was selected

for this study. This selection considered data completeness, geographic representation, and population size (see Appendix A² for Supplementary Table 1). Table 1 includes the descriptive statistics of the variables (see Supplementary Table 2 for the descriptive statistics of the nominal variables).

Table 1. Descriptive Statistics of Continuous Variables

Variables	<i>M (SD)</i>	<i>Min</i>	<i>Max</i>	<i>n</i>
<i>Individual-level factors</i>				
Internet access	0.50 (0.50)	0	1	724587
Education	1.89 (0.70)	1	3	706741
Age	40.37 (19.78)	3	101	724389
Life satisfaction	0.71 (0.28)	0	0.88	724587
Communication action context	0.53 (0.35)	0	1	724587
Civic engagement	0.83 (0.95)	0	3	724587
<i>Country-level Factors</i>				
GDP (Millions of current US\$)	2169243 (3524588)	4756	21400000	600
Democracy Index	0.56 (0.24)	0.12	0.96	706506
Year	2012.87	2006	2020	724587

Measurements

Civic Engagement

Broadly, civic engagement captures the extent to which people participate in informal or formal social activities to develop social capital (Adler & Goggin, 2005; Putnam, 1995). Gallup consistently measures people's behaviors, such as donating money, volunteering time, and helping strangers. These three questions were selected and summed to determine the number of behaviors each individual had conducted. That is, this measure indicates the extent to which people engage in civic behaviors in relation to other independent variables. The value of the composite score was measured on a scale from zero (0) to three (3). To compare the groups categorized by their levels of civic participation, this variable was considered a categorical polynomial variable for the analysis.

Internet Access

The data set included two questions about Internet access: (1) whether an individual has access to the Internet and (2) whether their home has access to the Internet. To verify one's access to the Internet in either way, a "yes" response to either of the questions was recoded as "have accessibility," whereas others who responded "no" to both questions were recoded as "have no accessibility."

² See OSF (https://osf.io/h2cq6/?view_only=1424b574cf344504af43b767e5e62a98) for supplementary tables.

Life Satisfaction

Life satisfaction encapsulates a person's stable traits that correspond to how they perceive or interpret their life (Erdogan, Bauer, Truxillo, & Mansfield, 2012). The concept has been specifically strongly associated with traits that concern expressing emotions in response to life events (DeNeve & Cooper, 1998). Among the questions that captured individuals' feelings or satisfaction, eight traits were selected to encompass the overall concept of this construct: feeling well rested, experiencing physical pain (reverse-coded), experiencing worry (reverse-coded), experiencing sadness (reverse-coded), experiencing happiness and laughter, experiencing enjoyment, experiencing anger (reverse-coded), and being treated with respect. Respondents who underwent the listed experiences/feelings had their responses coded as "yes." If the respondent had not undergone the listed experiences/feelings, they were coded as "no" (Cronbach's $\alpha = 0.71$). Each participant's responses to eight items were summed and averaged for analysis using pairwise deletion. The greater the value, the more satisfied they were with their lives.

Communication Action Context

Communication action context encapsulates the social conditions in which people reside. Previously, CAC was often operationalized as public spaces, population diversity, residential stability, and so on, which are preconditions for neighborhood connections (e.g., de Souza Briggs, 2008; Kim et al., 2022; Sampson, 2012; Zhang et al., 2018). Previous studies tended to aggregate individual characteristics in perceiving social circumstances. However, we assessed individual and aggregated evaluations of social structures/systems. Here, we consider individual scores on the five questions Gallup consistently asked about the community where respondents resided. The questions evaluated education systems, quality of air, quality of water, quality of healthcare, and the quality and affordability of housing in their neighborhood. Respondents who were satisfied with the community items were coded as "yes." If not, they were coded as "no." Each participant's responses to these five items were summed and averaged for the analysis by using pairwise deletion (Cronbach's $\alpha = 0.66$).

Democracy Index

To examine the social context, we used the Democracy Index collected by *The Economist*. The data addressed the state of each country's democracy and were accumulated based on five categories from 1996 to 2020: Democracy Index, vested interests, accountability of public officials, human rights, and freedom of association. For this analysis, the data were selected in alignment with the years in which the Gallup survey was conducted. A country-level indicator, such as the Democracy Index, contributes to understanding how cultural norms are associated with civic engagement, which is distinct to each country. The index ranges from zero (0, bad) to one (1, good). These data are publicly available on *The Economist's* website. The greater the score a society has on the democracy index, the more democratic the society is.

Gross Domestic Product

In addition to cultural norms, GDP was used to evaluate the aggregate level of social influence. The GDP data of countries is available in the *World Bank* data archives. They provide the GDP information

of countries in U.S. dollars, and the current study used information based on the countries targeted for the analysis.

Analytical Design

The current study used multilevel multinomial logit models to configure the hypothesized relationships between individual- and country-level predictors and civic engagement, while controlling for the effect where individuals are nested in the context of their respective countries. The strength of the relationships between variables was tested, while considering the distinctions imposed by each country, given that multilevel models hold contextual variations across countries. By holding random variations imposed by countries where individuals reside, both individual (e.g., life satisfaction, CAC, gender, education, and age) and country factors (Democracy Index, GDP) could be properly tested. Moreover, by using multilevel multinomial logit regression, the models predicted the levels of civic engagement relative to the reference group, while alleviating assumptions of multinomial logistic regression specifically to mitigate the skewness of the dependent variable (i.e., civic engagement; Leeuw & Meijer, 2007). The current study used *never attended* as the reference group compared with the other groups, such as *participating in civic activities once, twice, and three times*.

Based on the hypotheses that aim to validate fixed effects at the individual, country, and cross levels, while also accounting for random effects that varied by country, three models were formulated and evaluated accordingly (adapted from Paek, Hove, & Oh, 2013). In the first model, the intraclass correlation (ICC) was calculated to determine the qualifications of the mixed-linear models. The ICC measures the random error of the null model without including any variables that verify random effects correlated to groups (i.e., countries). Here, the ICC indicated that on average, 35% of the variance could be attributed to the variance embedded in countries (see Appendix A: Supplementary Table 3). This value is moderate, given that previous literature confirmed that values between 0.05 and 0.20 are prevalent, and appropriate values for multilevel analysis stay within this range (Snijders & Bosker, 1999). Moreover, the intercept of this model was statistically significant, supporting the idea that the level of people participating in civic behaviors varies by country.

In the second model, individual-level factors, including Internet access, life satisfaction, CAC, gender, education, and age, were added to the model to examine the role of personal characteristics in individuals' civic engagement.

In the third model, country-level factors were added, including the Democracy Index, GDP, year,³ the interaction between democracy and year, and cross-level interaction terms, including the following: year and Democracy Index, Internet access and GDP, Internet access and Democracy Index, and Internet access and year interactions. Interaction terms were selected based on predictions grounded in theoretical reasoning. Supplementary Table 4 summarizes the models, including random effects, fixed effects, and cross-level interactions.

³ The year was categorized into country-level factors as this variable was applied to collective entities rather than individuals.

Results

The Roles of Individual-Level Factors

The first hypothesis proposed a positive correlation between Internet access and civic engagement, which was supported by the results. This pattern was consistent with the groups of people who participated in civic activities once, twice, or three times compared with the reference group (i.e., never attended) ($\beta_{0 \text{ vs. } 1} = 82.76$, $p_{0 \text{ vs. } 1} < .001$, $\beta_{0 \text{ vs. } 2} = 98.79$, $p_{0 \text{ vs. } 2} < .001$, $\beta_{0 \text{ vs. } 3} = 121.71$, $p_{0 \text{ vs. } 3} < .001$, see Table 2). In other words, individuals with Internet access were more likely to participate in civic activities than individuals without Internet access—everything else being equal. Thus, H1 is supported (see Supplementary Table 6 for a summary of the results).

Table 2. Estimates of Fixed Effects and Random Effects (Estimated Coefficients) on Civic Engagement

	0 vs. 3 (levels of civic engagement)			0 vs. 2			0 vs. 1		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Intercept	0.15*** (-12.51)	-4.04*** (0.16)	737.019*** (42.89)	0.43*** (-7.20)	-2.66** * (0.12)	409.43*** (29.47)	0.71*** (-3.89)	-1.55** * (0.09)	-215.14** * (23.55)
(Individual-level variable)									
Internet Access (γ_{10})		0.84*** (0.01)	121.71*** (6.21)		0.70*** (0.01)	98.79*** (4.32)		0.46*** (0.01)	82.76*** (3.59)
Life satisfaction (γ_{20})		0.27*** (0.02)	0.35*** (0.02)		0.24*** (0.01)	0.28*** (0.01)		0.22*** (0.01)	0.26*** (0.01)
Communication action context (γ_{30})		1.73*** (0.02)	1.70*** (0.02)		1.47*** (0.01)	1.46*** (0.01)		1.18*** (0.01)	1.15*** (0.01)
Gender (2 = female) (γ_{40})		-0.08*** (0.01)	-0.08*** (0.01)		-0.02** (0.01)	-0.02** (0.01)		-0.02** * (0.01)	-0.02*** (0.01)
Education (3 vs. 1) (γ_{50})		0.88*** (0.02)	0.93*** (0.02)		0.66*** (0.01)	0.68 *** (0.01)		0.29*** (0.01)	0.30*** (0.01)
Education (2 vs. 1) (γ_{50})		0.40*** (0.01)	0.44*** (0.01)		0.38*** (0.01)	0.40*** (0.01)		0.21*** (0.01)	0.23*** (0.01)
Age (γ_{60})		0.01*** (0.00)	0.01*** (0.00)		0.00*** (0.00)	0.00*** (0.00)		0.00*** (0.00)	0.00*** (0.00)
(Country-level variables)									
Democracy index (γ_{01})			256.33*** (14.28)			176.73*** (9.54)			89.01*** (8.07)
GDP ¹ (γ_{02})			-89.66*** (3.76)			-54.28*** (2.54)			-32.79*** (2.02)
Year (γ_{03})			-0.37*** (0.02)			-0.20*** (0.01)			-0.10*** (0.01)
Democracy index x Year (γ_{04})			-0.13 *** (0.01)			-0.09*** (0.00)			-0.05*** (0.00)
GDP x Year (γ_{05})			0.04*** (0.00)			0.03*** (0.00)			0.02*** (0.00)

Internet access (1 = have access) x Dem Index (γ_{11})	0.07 (0.06)	-0.03 (0.04)	0.01*** (0.03)
Internet access (1 = have access) x GDP (γ_{12})	-0.04* (0.02)	-0.04*** (0.01)	0.01 (0.01)
Internet access (1 = have access) x Year (γ_{13})	-0.06*** (0.00)	-0.05*** (0.00)	-0.04*** (0.00)
AIC	8252113.21	8369613.95	8191967.30

Note. *** $p < .001$, ** $p < .01$, * $p < .05$; Estimated coefficient with standard errors in parentheses. Education is categorized accordingly: 1 = Completed elementary education or less (up to 8 years of basic education), 2 = Secondary to three-year tertiary/secondary education and some education beyond secondary education (9–15 years of education), 3 = Completed four years of education beyond high school and/or received a four-year college degree¹; GDP was log transformed; 0 vs. 3 indicates the comparison between a reference group (i.e., never engaged in civic activities) and a group who engaged in civic activities three times; 0 vs. 2 indicates the comparison between a reference group and a group who engaged in civic activities twice; 0 vs. 1 indicates the comparison between a reference group and a group who engaged in civic activities once.

In support of the significant role of Internet access, the trend of Internet access over time was further examined. The coefficient was negative, showing that the relationship between Internet access and civic engagement decreased over time ($\beta_{0 \text{ vs. } 3} = -0.06$, $p_{0 \text{ vs } 3} < .001$, $\beta_{0 \text{ vs } 2} = -0.05$, $p_{0 \text{ vs } 2} < .001$, $\beta_{0 \text{ vs } 1} = -0.04$, $p_{0 \text{ vs } 1} < .001$, see Table 2). This tendency was observed consistently among groups that participated in civic activities three times, twice, or once, as opposed to those who never attended. Internet access was anticipated to be positively associated with civic engagement across time; however, the results showed otherwise. This result explains the interaction effects of Internet access across time (RQ1) (see Supplementary Table 6 for a summary of the results).

Moreover, the role of additional individual-level variables, (1) life satisfaction and (2) CAC, was posited in H2 and H3, respectively. The results revealed that people experiencing greater life satisfaction were more likely to be involved in civic engagement, supporting H2. This pattern was consistent among the groups who participated once, twice, or three times compared with the reference group ($\beta_{0 \text{ vs } 1} = 0.26$, $p_{0 \text{ vs } 1} < .001$, $\beta_{0 \text{ vs } 2} = 0.28$, $p_{0 \text{ vs } 2} < .001$, $\beta_{0 \text{ vs } 3} = 0.35$, $p_{0 \text{ vs } 3} < .001$, see Table 2). The exponentiation of the coefficient indicated that if people were to increase their satisfaction score by one point, the odds that they would have participated in civic engagement three times rather than never participating would be multiplied by 1.42; hence, it increases the odds of engagement by 42%, while holding all other variables in the model constant (see Supplementary Table 5). This tendency also applied to the groups that participated once or twice, as opposed to never. The results indicate that as the scores of life satisfaction increased, people were more likely to engage in civic activities; thus, H2 was supported (see Supplementary Table 6 for a summary of the results).

Furthermore, CAC was positively correlated with the extent to which people engaged in civic activities ($\beta_{0 \text{ vs } 1} = 1.15$, $p_{0 \text{ vs } 1} < .001$, $\beta_{0 \text{ vs } 2} = 1.46$, $p_{0 \text{ vs } 2} < .001$, $\beta_{0 \text{ vs } 3} = 1.70$, $p_{0 \text{ vs } 3} < .001$, see Table 2). If people were to increase their CAC score by one point, the odds of them participating three times rather than never participating would be multiplied by 5.47; thus, it increased the odds by 447% while holding all other variables in the model constant (see Supplementary Table 5). This tendency also applied to the groups that participated once or twice, as opposed to never participating. The result reveals that as CAC scores increased, people were more likely to attend civic activities; hence, H3 was supported (see Supplementary Table 6 for a summary of the results).

The Roles of Country-Level Factors

The Democracy Index represents cultural norms present in societies, and people residing in countries with a higher democracy index are thought to be more likely to engage in civic activities. As anticipated, the Democracy Index was positively associated with civic engagement. Moreover, a positive association was revealed across the groups participating in civic activities once, twice, or three times when compared with the reference group (i.e., never attended) ($\beta_{0 \text{ vs } 1} = 89.017$, $p_{0 \text{ vs } 1} < .001$, $\beta_{0 \text{ vs } 2} = 176.73$, $p_{0 \text{ vs } 2} < .001$, $\beta_{0 \text{ vs } 3} = 256.33$, $p_{0 \text{ vs } 3} < .001$, see Table 2). This result supported H4 (see Supplementary Table 6 for a summary of the results).

As examined earlier, people residing in countries where the Democracy Index was high compared with low were more likely to participate in civic activities once, twice, or three times compared with never.

However, this relationship was reversed when accounting for time ($\beta_{0\text{ vs }1} = -0.05$, $p_{0\text{ vs }1} < .001$, $\beta_{0\text{ vs }2} = -0.09$, $p_{0\text{ vs }2} < .001$, $\beta_{0\text{ vs }3} = -0.13$, $p_{0\text{ vs }3} < .001$, see Table 2). That is, people living in highly ranked democratic countries were less likely to participate in civic activities over an extended period (RQ2) (see Supplementary Table 6 for a summary of the results).

To evaluate the relationship between a country's economic indicator and civic engagement, the groups of people engaged in civic activities once, twice, or three times were compared with the reference group in terms of their country's GDP. Unexpectedly, as GDP increased, people were less likely to be involved in civic activities; the results were statistically significant for those who participated once, twice, or three times in civic activism compared with the reference group ($\beta_{0\text{ vs }1} = -32.79$, $p_{0\text{ vs }1} < .001$, $\beta_{0\text{ vs }2} = -54.28$, $p_{0\text{ vs }2} < .001$, $\beta_{0\text{ vs }3} = -89.66$, $p_{0\text{ vs }3} < .001$, see Table 2). The result did not support H5 (see Supplementary Table 6 for a summary of the results).

Additionally, the relationship between GDP and civic engagement was positive across the groups over time. In other words, for the groups who participated in civic activities once, twice, or three times in comparison with the reference group, the correlation of the factors significantly increased as time passed ($\beta_{0\text{ vs }1} = 0.02$, $p_{0\text{ vs }1} < .001$, $\beta_{0\text{ vs }2} = 0.03$, $p_{0\text{ vs }2} < .001$, $\beta_{0\text{ vs }3} = 0.04$, $p_{0\text{ vs }3} < .001$, see Table 2). This result contributes to a formative understanding of the role of time in describing how economic growth is associated with the extent to which people participate in civic activities (see Supplementary Table 6 for a summary of the results).

Interaction Effects of Internet Access and Country-Level Factors

The results showed that the relationship between individuals' Internet access and civic engagement was partly moderated by a country's Democracy Index and its GDP. The coefficients indicating interactions between Internet access and the Democracy Index were positive, except for a group who participated in civic activities twice in opposition to those who never attended; yet, the positive relationship was only statistically significant for a group who attended civic activities once as opposed to those who never attended ($\beta_{0\text{ vs }1} = 0.01$, $p_{0\text{ vs }1} < .001$, $\beta_{0\text{ vs }2} = -0.03$, $p_{0\text{ vs }2} = .51$, $\beta_{0\text{ vs }3} = 0.07$, $p_{0\text{ vs }3} = .24$, see Table 2). Moreover, the relationships between Internet access and GDP across the models were all significantly negative, except for the group who participated in civic activities once, as opposed to the reference group ($\beta_{0\text{ vs }1} = 0.01$, $p_{0\text{ vs }1} = .28$, $\beta_{0\text{ vs }2} = -0.04$, $p_{0\text{ vs }2} < .001$, $\beta_{0\text{ vs }3} = -0.04$, $p_{0\text{ vs }3} = .02$, see Table 2; Supplementary Table 6 for a summary of the results).

Discussion and Conclusions

This study assessed the role of individual- and country-level variables in civic engagement across different countries. First, individual-level factors (including Internet access, life satisfaction, and communication action context [CAC]) were found to have a significant and positive association with individuals' participation in civic activities. Notably, Internet access played a significant role in shaping civic engagement. Extensive research supports the idea that Internet access enhances connectivity with others and leads to increased civic participation (Wellman et al., 2001). It is important to note that the persistent global inequality in Internet access (García-Escribano, 2020) might have resulted in lower levels of civic

engagement in countries with limited technological support. Nevertheless, the increasing Internet penetration rates globally (ITU, 2020) offer optimism, suggesting that civic engagement levels are likely to rise as more people gain Internet access.

Interestingly, while Internet access showed a positive correlation with civic engagement, this relationship was not consistent over time. When considering the year as a moderator, the relationship between Internet access and civic engagement trended negatively (cf. Boulianne, 2020). This observation is intriguing, as the year itself exhibited a positive association with civic engagement, indicating an increase in civic engagement over time regardless of one's Internet access. This phenomenon may be related to significant events, such as the Arab Spring, where Internet access played a crucial role in enabling citizens to come together for specific causes. The number of people who reported engaging in civic activities three times doubled from 2009 to 2011 in the United Arab Emirates (see Appendix B for results in respective countries). Otherwise, the levels of civic engagement increased linearly or were constant over time in more developed countries, such as Canada, Japan, Germany, Switzerland, and the United Kingdom. However, as this study did not measure organizational or political participation, more research is needed to further explore this relationship and its underlying dynamics.

The present study also did not distinguish the specific services that the Internet provides; the emergence of social media is likely to have a significant association with the levels of civic engagement over time. Social media platforms, a new and dominant form of Internet services, enable people to be exposed to far more information than they would be able to otherwise, observe current events as they occur, expand their civic life skills, and connect to social networks (Boulianne, 2020). Since the early 2000s, social media platforms have been actively introduced, and since then, many people have joined these platforms. Because of their ability to deliver informational, expressive, and social functions and features, enabling individuals to gain knowledge for social opportunities and social networks, these platforms are likely to strengthen their users' ability and propensity to engage in civic life (Boulianne, 2020; Skoric et al., 2016). That is, social media could have played a role in the varied relationship between Internet access and civic engagement during the period specified in the present study. Given the influence of social media usage, the current diverse and changing digital environment should be considered to understand the full relationship between Internet access and civic engagement.

Individuals' life satisfaction and perceptions of community systems were found to be positively associated with civic engagement. Theoretically, higher life satisfaction, which reflects an individual's psychological, social, and behavioral well-being, is associated with increased social trust and interaction, both of which can foster civic engagement (Brehm & Rahn, 1997; Shah, Kwak, & Yoon, 2001). It is presumed that individuals with higher life satisfaction, partly because of greater social trust and interaction, are more likely to engage in civic activities. However, this study did not establish a series of mediation effects but rather inferred them based on a theoretical rationale.

CAC also demonstrated a direct association with civic engagement. As the results suggest, the community's structure plays a pivotal role in shaping residents' experiences, influencing their likelihood of engaging in civic behaviors. A community that fosters open and socially interactive dialogue tends to

encourage its members to participate in civic activities, emphasizing the importance of considering community dynamics when studying civic engagement.

When examining the effects of country-level variables, the Democracy Index and GDP were included in the models to assess their relationships with individuals' civic engagement. The results indicated that the political indicator Democracy Index was positively associated with civic engagement, whereas the economic indicator GDP was negatively associated with civic engagement. This suggests that civic behaviors are more closely aligned with political indicators that reflect the cultural contexts shaping citizens' propensity for civic engagement than economic indicators. Interestingly, the relationship between GDP and civic engagement was positive over time, whereas the relationship between the Democracy Index and civic engagement was negative over time. As mentioned earlier, time added further contextual information, resulting in varying relationships between variables. Although further investigation is needed to delve into each relationship, it is worth noting that the world's average GDP significantly declined from 2007 to 2009 because of the Great Recession. Although GDP was not initially positively associated with civic engagement, its relationship might have reversed in recent years. This suggests that the relationship between GDP and civic engagement could have been positive when accounting for the global economic recession experienced during that time. Furthermore, the Democracy Index might not have exhibited as much fluctuation as GDP over time and might have shown a negative relationship because most countries had already undergone democratization or their democratization process had plateaued, with insufficient margin for significant increases to achieve statistical significance. Nevertheless, both economic and political indicators were robust enough to vary civic engagement, and the role of time in moderating these relationships warrants further study.

Additionally, to demonstrate the cross-level variation in the relationship between Internet access and civic engagement, this study incorporated political and economic indicators, such as the Democracy Index and GDP, and included interaction terms for analysis. Contrary to the hypothesis, the results displayed inconsistent correlations between Internet access and civic engagement when moderated by country-level variables. A partially significant positive effect was observed in terms of the Democracy Index, suggesting that the relationship between the Internet and civic engagement increased as the Democracy Index score increased. These results seem to indicate that people in developing countries (which presumably have a lower democratization status) face barriers such as costly and limited infrastructure and low digital literacy compared with their counterparts in developed countries (Chetty et al., 2018), thereby highlighting the structure of the existing digital divide worldwide. However, even though the effect was not consistent across the models, GDP attenuated the relationship between Internet access and civic engagement. These inconsistent findings raise questions about the results of a recent meta-analysis of Internet effects that reported no significant cross-national differences (i.e., Boulianne, 2020). However, previous studies have not used consistent measures to represent each country's idiosyncrasies. Inconsistent measures in the current study might have led to unexpected findings, warranting further investigation.

Limitations and Future Directions

Despite providing a broad overview of the relationships between individual- and country-level factors and civic engagement, this study has certain limitations that need to be addressed in future research. First, this study did not establish causal relationships to explain the observed findings. As the study relied

on cross-sectional survey data collected over an extended period, determining causality was beyond its scope. Future research should aim to assess causal relationships based on the results obtained here. A panel study or field experiment could be potential methods to empirically test these causal relationships and offer insights into the underlying mechanisms.

Additionally, the use of secondary data for analysis in the current research might have limitations in terms of the operationalization of the proposed variables. For instance, in assessing levels of civic engagement, this study categorized people into groups based on their experiences of civic engagement. Since civic engagement was not measured as a continuous variable, direct increases in civic engagement corresponding to the independent variables were not captured. Finally, this study focused on Internet access (i.e., Internet penetration) rather than on different dimensions of Internet access or types of Internet use. Helsper (2021) suggests that Internet access can vary along different dimensions (e.g., quality, ubiquity, and autonomy), and the relationship may differ based on which dimension researchers investigate. Additionally, as highlighted in the literature review, specifying different types of Internet use is crucial, as the influence of the Internet on individuals varies depending on the purposes for which it is used (e.g., Eveland & Scheufele, 2000; Jennings & Zeitner, 2003; Shah, Kwak, & Holbert, 2001; Shah et al., 2005). Future studies should explore the role of each dimension of Internet access and Internet use in civic behaviors across countries to expand the concept and account for the variations inherent in each country.

References

- Adler, R. P., & Goggin, J. (2005). What do we mean by "civic engagement?" *Journal of Transformative Education*, 3(3), 236–253. doi:10.1177/1541344605276792
- Ahmed, S., Cho, J., Jaidka, K., Eichstaedt, J. C., & Ungar, L. H. (2020). The Internet and participation inequality: A multilevel examination of 108 countries. *International Journal of Communication*, 14, 22. Retrieved from <https://escholarship.org/uc/item/82v574hf>
- Almond, G. A., & Verba, S. (1963). *The civic culture: Political attitudes and democracy in five nations*. Princeton, NJ: Princeton University Press.
- Ball-Rokeach, S. J., Kim, Y. C., & Matei, S. (2001). Storytelling neighborhood: Paths to belonging in diverse urban environments. *Communication Research*, 28(4), 392–428. doi:10.1177/009365001028004003
- Boulianne, S. (2009). Does Internet use affect engagement? A meta-analysis of research. *Political Communication*, 26(2), 193–211. doi:10.1080/10584600902854363
- Boulianne, S. (2020). Twenty years of digital media effects on civic and political participation. *Communication Research*, 47(7), 947–966. doi:10.1177/0093650218808186

- Brehm, J., & Rahn, W. (1997). Individual-level evidence for the causes and consequences of social capital. *American Journal of Political Science*, 41(3), 999–1023. doi:10.2307/2111684
- Chetty, K., Qigui, L., Gcora, N., Josie, J., Wenwei, L., & Fang, C. (2018). Bridging the digital divide: Measuring digital literacy. *Economics*, 12(1), 20180023. doi:10.5018/economics-ejournal.ja.2018-23
- Crowley, F., & Walsh, E. (2021). Tolerance, social capital, and life satisfaction: A multilevel model from transition countries in the European Union. *Review of Social Economy*, 82(1), 1–28. doi:10.1080/00346764.2021.1957994
- Curtis, J. E., Baer, D. E., & Grabb, E. G. (2001). Nations of joiners: Explaining voluntary association membership in democratic societies. *American Sociological Review*, 66(6), 783–805. doi:10.2307/3088873
- Dahl, R. A. (2005). What political institutions does large-scale democracy require? *Political Science Quarterly*, 120(2), 187–197. doi:10.2307/20202514
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, 124(2), 197–229. doi:10.1037/0033-2909.124.2.197
- de Souza Briggs, X. (2008). *Democracy as problem solving: Civic capacity in communities across the globe*. Cambridge, MA: MIT Press.
- DiMaggio, P. J., & Hargittai, E. (2001). *From the "digital divide" to "digital inequality": Studying Internet use as penetration increases*. Woodrow Wilson School of Public Policy and International Affairs. Retrieved from https://digitalinclusion.typepad.com/digital_inclusion/documentos/digitalequality.pdf
- Erdogan, B., Bauer, T. N., Truxillo, D. M., & Mansfield, L. R. (2012). Whistle while you work: A review of the life satisfaction literature. *Journal of Management*, 38(4), 1038–1083. doi:10.1177/0149206311429379
- Eveland Jr, W. P., & Scheufele, D. A. (2000). Connecting news media use with gaps in knowledge and participation. *Political Communication*, 17(3), 215–237. <https://doi.org/10.1080/105846000414250>
- Fierro, P., Aroca, P., & Navia, P. (2020). How people access the internet and the democratic divide: Evidence from the Chilean region of Valparaiso 2017, 2018 and 2019. *Technology in Society*, 63, 101432. doi:10.1016/j.techsoc.2020.101432

Wagner, K. M., & Gainous, J. (2013). Digital uprising: the internet revolution in the middle east. *Journal of Information Technology & Politics*, 10(3), 261–275.

<https://doi.org/10.1080/19331681.2013.778802>

Gainous, J., Wagner, K. M., & Abbott, J. P. (2015). Civic disobedience: Does internet use stimulate political unrest in East Asia? *Journal of Information Technology & Politics*, 12(2), 219–236.

doi:10.1080/19331681.2015.1034909

García-Escribano, M. (2020, June 29). *Low internet access driving inequality*. International Monetary Fund. Retrieved from <https://blogs.imf.org/2020/06/29/low-internet-access-driving-inequality/>

Gil de Zúñiga, H., Molyneux, L., & Zheng, P. (2014). Social media, political expression, and political participation: Panel analysis of lagged and concurrent relationships. *Journal of Communication*, 64(4), 612–634. doi:10.1111/jcom.12103

Grillo, M. C., Teixeira, M. A., & Wilson, D. C. (2010). Residential satisfaction and civic engagement: Understanding the causes of community participation. *Social Indicators Research*, 97, 451–466.

doi:10.1007/s11205-009-9511-0

Gundelach, B. (2016). Economic development and civic engagement in Latin America: A comparative study. *Nonprofit and Voluntary Sector Quarterly*, 45(2), 238–260.

doi:10.1177/0899764015578287

Helsper, E. (2021). *The digital disconnect: The social causes and consequences of digital inequalities*. London, UK: SAGE Publications.

International Monetary Fund. (n.d.). *Real GDP growth*. Retrieved from

https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD

International Telecommunication Union. (2015). *Measuring digital development ICT facts & figures*.

Retrieved from [https://www.itu.int/en/ITU-](https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf)

[D/Statistics/Documents/facts/ICTFactsFigures2015.pdf](https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2015.pdf)

International Telecommunication Union. (2020). *Measuring digital development facts and figures*.

Retrieved from <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf>

Jagers, K., & Gurr, T. R. (1995). Tracking democracy's third wave with the Polity III data. *Journal of Peace Research*, 32(4), 469–482. doi:10.1177/0022343395032004007

Jennings, M., & Zeitner, V. (2003). Internet use and civic engagement: A longitudinal analysis. *Public Opinion Quarterly*, 67(3), 311–334. doi:10.1086/376947

- Khan, M. L., Welsler, H. T., Cisneros, C., Manatong, G., & Idris, I. K. (2020). Digital inequality in the Appalachian Ohio: Understanding how demographics, internet access, and skills can shape vital information use (VIU). *Telematics and Informatics, 50*, 101380. <https://doi.org/10.1016/j.tele.2020.101380>
- Kim, Y. C., & Ball-Rokeach, S. J. (2006). Community storytelling network, neighborhood context, and civic engagement: A multilevel approach. *Human Communication Research, 32*(4), 411–439. doi:10.1111/j.1468-2958.2006.00282.x
- Kim, Y. C., Kim, Y., & Chae, Y. G. (2022). Communication and difference in urban neighborhoods: A communication infrastructure theory perspective. *Communication Monographs, 89*(4), 419–444. doi:10.1080/03637751.2021.2020864
- Lee, S. H. (2017). Digital democracy in Asia: The impact of the Asian internet on political participation. *Journal of Information Technology & Politics, 14*(1), 62–82. doi:10.1080/19331681.2016.1214095
- Leeuw, J., & Meijer, E. (Eds.). (2007). *Handbook of multilevel analysis*. New York, NY: Springer.
- Martin, S. P., & Robinson, J. P. (2007). The income digital divide: Trends and predictions for levels of Internet use. *Social Problems, 54*(1), 1–22. doi:10.1525/sp.2007.54.1.1
- Oxendine, A., Sullivan, J. L., Borgida, E., Riedel, E., Jackson, M., & Dial, J. (2007). The importance of political context for understanding civic engagement: A longitudinal analysis. *Political Behavior, 29*(1), 31–67. doi:10.1007/s11109-006-9016-3
- Paek, H. J., Hove, T., & Oh, H. J. (2013). Multilevel analysis of the impact of school-level tobacco policies on adolescent smoking: The case of Michigan. *Journal of School Health, 83*(10), 679–689. doi:10.1111/josh.12081
- Park, N. (2004). The role of subjective well-being in positive youth development. *The Annals of the American Academy of Political and Social Science, 591*(1), 25–39. doi:10.1177/0002716203260078
- Pew Research Center. (2021, April 7). *Internet, broadband fact sheet*. Retrieved from <https://www.pewresearch.org/internet/fact-sheet/internet-broadband/>
- Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy, 6*(1), 65–78. doi:10.1007/978-1-349-62965-7_12
- Putnam, R. D., Leonardi, R., & Nanetti, R. Y. (1992). *Making democracy work: Civic traditions in modern Italy*. Princeton, NJ: Princeton University Press.

- Reglitz, M. (2020). The human right to free internet access. *Journal of Applied Philosophy*, 37(2), 314–331. doi:10.1111/japp.12395
- Sampson, R. J. (2012). *Great American city: Chicago and the enduring neighborhood effect*. Chicago, IL: University of Chicago Press.
- Scheufele, D. A., & Shah, D. V. (2000). Personality strength and social capital: The role of dispositional and informational variables in the production of civic participation. *Communication Research*, 27(2), 107–131. doi:10.1177/009365000027002001
- Schofer, E., & Fourcade-Gourinchas, M. (2001). The structural contexts of civic engagement: Voluntary association membership in comparative perspective. *American Sociological Review*, 66(6), 806–828. doi:10.2307/3088874
- Shah, D. V., Cho, J., Eveland, W. P., Jr., & Kwak, N. (2005). Information and expression in a digital age: Modeling Internet effects on civic participation. *Communication Research*, 32(5), 531–565. doi:10.1177/0093650205279209
- Shah, D. V., Kwak, N., & Holbert, R. L. (2001). "Connecting" and "disconnecting" with civic life: Patterns of Internet use and the production of social capital. *Political Communication*, 18(2), 141–162. doi:10.1080/105846001750322952
- Shah, D. V., McLeod, J. M., & Yoon, S. H. (2001). Communication, context, and community: An exploration of print, broadcast, and Internet influences. *Communication Research*, 28(4), 464–506. doi:10.1177/009365001028004005
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London, UK: SAGE Publications
- Skoric, M. M., Zhu, Q., Goh, D., & Pang, N. (2016). Social media and citizen engagement: A meta-analytic review. *New Media & Society*, 18(9), 1817–1839. doi:10.1177/1461444815616221
- Stadelmann-Steffen, I., & Freitag, M. (2011). Making civil society work: Models of democracy and their impact on civic engagement. *Nonprofit and Voluntary Sector Quarterly*, 40(3), 526–551. doi:10.1177/0899764010362114
- van Deursen, A. J., & van Dijk, J. A. (2014). The digital divide shifts to differences in usage. *New Media & Society*, 16(3), 507–526. doi:10.1177/1461444813487959
- Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the Internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment. *American Behavioral Scientist*, 45(3), 436–455. doi:10.1177/00027640121957286

The World Bank. (n.d.). *Individuals using the Internet (% of population)*. Retrieved from <https://data.worldbank.org/indicator/IT.NET.USER.ZS>

Xenos, M., & Moy, P. (2007). Direct and differential effects of the Internet on political and civic engagement. *Journal of Communication*, 57(4), 704–718. doi:10.1111/j.1460-2466.2007.00364.x

Zhang, C., Motta, W., & Georgiou, M. (2018). The enacted communication action context of ethnically diverse neighborhoods and its implications for intergroup communication. In Y. C. Kim, M. Matsaganis, H. Wilkin, & J. Jung (Eds.), *The communication ecology of 21st century urban communities* (pp.124–145). New York, NY: Peter Lang.