

The Grey Divide: How Digital Access Mediates Generational Differences in Political Participation

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Abstract

Digital technologies increasingly mediate political participation, yet generational differences in digital access create new inequalities in democratic engagement. This study examines how differential digital usage patterns mediate the relationship between generational cohort membership and political participation in the United States. Using World Values Survey Wave 7 data (N=2,596) and structural equation modeling, we test how van Dijk and Hacker’s multidimensional digital divide framework explains generational differences in civic engagement. Results reveal significant mediation effects: digital usage intensity partially mediates the relationship between age cohorts and political participation ($\beta = 0.23$, $p < 0.001$), with older adults who overcome digital barriers showing 18% higher participation rates than age-matched peers. Information source diversity strengthens this relationship ($\beta = 0.31$, $p < 0.001$), with mixed-media users demonstrating enhanced civic engagement across all age groups. The “grey divide” manifests distinctly in political contexts, where digitally engaged older adults develop complementary rather than substitutive participation patterns. These findings demonstrate that addressing digital inequalities requires understanding usage patterns beyond basic access, with important implications for democratic equality in an increasingly digital political environment.

Keywords: grey divide, digital divide, political participation, generational cohorts, structural equation modeling, World Values Survey, democratic engagement

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1 Introduction

The rapid digitization of political processes has created a fundamental challenge for democratic equality: as digital technologies become essential infrastructure for political participation, generational differences in digital access and usage create new forms of civic inequality. While younger Americans seamlessly integrate online and offline political activities, older citizens face substantial barriers that may systematically exclude them from increasingly digital democratic processes (Boulianne and Koc-Michalska, 2020; Vaccari et al., 2021). This “grey divide” represents more than a simple technology gap—it threatens the foundational democratic principle of equal political voice across all population segments.

Existing research has inadequately addressed this challenge by focusing primarily on basic internet access rather than the complex usage patterns that actually drive political engagement (Ohme, Abedin and Bramlett, 2021). Most studies treat digital divides as binary access problems, ignoring how different generational cohorts use digital tools for distinct types of political participation (Yarchi, Baden and Kligler-Vilenchik, 2021). This approach misses the crucial finding that older adults who overcome initial digital barriers often develop sophisticated political engagement strategies that complement rather than replace traditional civic activities (Rosenzweig et al., 2021).

The COVID-19 pandemic has intensified these concerns by accelerating the digitization of political processes, from campaign activities to government services, potentially exacerbating existing generational inequalities in democratic participation (Kim et al., 2022). Understanding how digital divides mediate generational differences in political participation has become critical for maintaining democratic inclusion in an increasingly digital political environment.

This study addresses these gaps by applying van Dijk and Hacker’s multidimensional digital divide framework to examine how usage patterns, rather than simple access, mediate the relationship between generational cohort membership and political participation. Drawing on World Values Survey Wave 7 data, we move beyond basic connectivity measures to examine digital skills, usage diversity, and information source patterns that

different generational cohorts employ in political engagement.

Our research tests four specific hypotheses: (H1) Digital usage intensity and diversity partially mediate the relationship between generational cohort membership and political participation, with younger cohorts showing higher digital political engagement. (H2) Among internet users, generational differences in digital skills and usage purposes predict distinct participation patterns, with older users focusing more on information consumption and younger users engaging more in interactive activities. (H3) Older adults who overcome digital barriers develop complementary participation patterns that enhance rather than replace traditional civic engagement. (H4) Information source diversity moderates age effects on political participation, with mixed-media users showing enhanced engagement regardless of generational cohort.

This research makes three key theoretical contributions. First, it provides the first systematic application of van Dijk’s four-stage access model to political participation research, demonstrating how motivational, material, skills, and usage access jointly shape civic engagement. Second, it advances understanding of the grey divide by showing how it manifests distinctly in political contexts compared to other social domains. Third, it integrates digital divide theory with the civic voluntarism model to explain how technological inequalities interact with traditional participation resources.

The findings have important implications for democratic theory and practice, suggesting that digital inclusion policies must address usage patterns and skills development rather than focusing solely on connectivity, and that political organizations must develop strategies that accommodate diverse generational approaches to digital civic engagement.

2 Literature Review

2.1 Theoretical Framework: Digital Divides as Multidimensional Phenomena

The evolution from first-level to second-level digital divide research has fundamentally transformed understanding of how technology access shapes social and political outcomes.

Early conceptualizations focused on binary distinctions between technology “haves” and “have-nots,” emphasizing physical access to computers and internet connections . However, this approach proved inadequate for explaining persistent inequalities among internet users, leading to more sophisticated frameworks that examine how people use digital technologies.

Van Dijk and Hacker’s (2003) four-stage access model represents the most comprehensive theoretical framework for understanding digital inequalities. Their model identifies four sequential barriers: motivational access (desire to use technology), material access (physical possession of devices and connectivity), skills access (ability to effectively use technology), and usage access (opportunities to use technology meaningfully). This framework is particularly relevant for political participation research because it recognizes that overcoming basic connectivity barriers does not automatically translate into meaningful civic engagement.

Recent research has validated this multidimensional approach across various contexts. van Deursen and Helsper (2021) demonstrated that among European internet users, usage patterns and digital skills are more predictive of social outcomes than basic access measures. Similarly, Scheerder, van Deursen and van Dijk (2020) found that second-level digital divides—differences in how people use technology—have become more consequential than first-level access divides for understanding social inequality.

The theoretical integration of digital divide research with political participation theory requires connecting van Dijk’s framework with established models of civic engagement, particularly Verba, Schlozman, and Brady’s (1995) civic voluntarism model. The civic voluntarism model identifies three factors that promote political participation: resources (time, money, skills), recruitment (being asked to participate), and motivation (interest, efficacy). Digital technologies potentially affect all three factors, creating new resources (digital skills, online networks), new recruitment mechanisms (social media mobilization), and new motivational structures (online political information exposure) (Boulianne and Koc-Michalska, 2020).

2.2 Generational Cohorts and Digital Political Engagement

Generational replacement theory suggests that political attitudes and behaviors formed during early socialization remain relatively stable throughout the life course, with social change occurring primarily through cohort replacement (Inglehart, 1997). This theory has important implications for understanding digital political engagement, as different generational cohorts experienced distinct technological environments during their formative years.

Digital natives—those who grew up with widespread internet access—may have fundamentally different approaches to political participation compared to older generations who acquired digital skills later in life. Bennett (2008) argue that younger generations engage in “actualizing citizenship” that emphasizes personal expression and issue-specific engagement through digital tools, while older generations practice “dutiful citizenship” focused on traditional civic obligations and institutions.

However, recent research challenges simple generational narratives about digital political engagement. Ohme, Abedin and Bramlett (2021) found that while younger Europeans show higher levels of digital political activity, older adults who are digitally engaged often demonstrate more sophisticated information-seeking behaviors and stronger connections between online and offline participation. Similarly, Yarchi, Baden and Kligler-Vilenchik (2021) demonstrated that older adults’ political social media use is more focused on information consumption and sharing, while younger users engage more in political expression and discussion.

The COVID-19 pandemic has complicated generational patterns by forcing rapid digital adoption across age groups. Rosenzweig et al. (2021) found that older adults who were compelled to adopt digital tools during the pandemic often maintained higher usage levels afterward, particularly for civic and political purposes. This suggests that barriers to older adult digital engagement may be more surmountable than previously assumed, with important implications for the grey divide.

2.3 Beyond Access: Usage Patterns and Political Outcomes

The shift from access-focused to usage-focused digital divide research has revealed that what people do online matters more than simply being online (van Deursen and Helsper, 2021). This perspective is crucial for understanding political participation, as citizens may have similar internet access but use digital technologies in vastly different ways for civic purposes.

Vaccari et al. (2021) identified several dimensions of digital political engagement that vary significantly across demographic groups: information seeking (consuming political news and information online), expression (sharing political opinions through social media or blogs), discussion (engaging in political conversations online), and mobilization (participating in online political organizing or campaign activities). Their research reveals that while basic political information seeking is relatively common across age groups, more interactive forms of digital political participation show sharp generational divides.

Information source diversity represents another crucial dimension of digital political engagement that may help explain generational differences in civic participation. Fletcher, Robertson and Nielsen (2020) found that citizens who consume political information from multiple sources—combining traditional media, social media, and direct institutional sources—demonstrate higher levels of political knowledge and engagement. However, information source patterns vary significantly by age, with older adults more likely to rely on traditional media supplemented by basic online sources, while younger adults navigate complex multi-platform information environments.

The diversity of digital political activities also creates different pathways for civic engagement across generational cohorts. Kim et al. (2022) demonstrated that older adults who engage digitally often focus on more formal political activities like contacting officials or accessing government services online, while younger adults are more likely to engage in informal political activities like social media political discussions or online political expression.

2.4 The Grey Divide and Democratic Participation

The concept of the “grey divide” (Friemel, 2014) represents a persistent form of digital inequality that cannot be fully explained by access barriers or basic demographic characteristics. Unlike other digital divides that may diminish over time through infrastructure development or skills training, the grey divide appears to reflect fundamental differences in technology attitudes, learning approaches, and usage motivations among older adults.

Recent research reveals complex patterns in how the grey divide manifests in political contexts. Rosenzweig et al. (2021) found that older adults who overcome initial digital barriers often bring established civic engagement patterns and higher levels of political interest to their digital activities, potentially resulting in more instrumental and focused uses of technology for political purposes. This challenges assumptions that digital political engagement simply replicates existing participation patterns online.

The political implications of the grey divide extend beyond individual participation to broader questions of democratic representation and equality. Vaccari et al. (2021) argue that as political processes become increasingly digitized, older adults who experience digital barriers may find themselves systematically excluded from important forms of civic engagement. This exclusion is particularly concerning given that older adults typically show higher levels of traditional political participation and have greater stakes in many policy outcomes.

However, research also suggests that the grey divide may manifest differently in political contexts compared to other social domains. Gibson and Cantijoch (2013) found that among politically interested older adults who develop basic digital skills, online political activities tend to complement rather than replace traditional forms of civic engagement, potentially leading to higher overall levels of political participation. This suggests that digital divides in political participation may be more about addition than substitution for older adults.

The intersection of the grey divide with broader patterns of political inequality creates complex dynamics that require careful empirical investigation. Older adults who overcome digital barriers may represent a select group with higher education, income,

and existing political engagement, raising questions about whether digital political participation reduces or reinforces existing civic inequalities (Scheerder, van Deursen and van Dijk, 2020).

2.5 Theoretical Integration and Conceptual Model

Integrating digital divide theory with political participation research requires recognizing that digital technologies do not operate in isolation from existing civic engagement patterns. Figure 1 presents our theoretical framework, which combines van Dijk’s access model with the civic voluntarism framework to explain how generational differences in digital access translate into differential political participation.

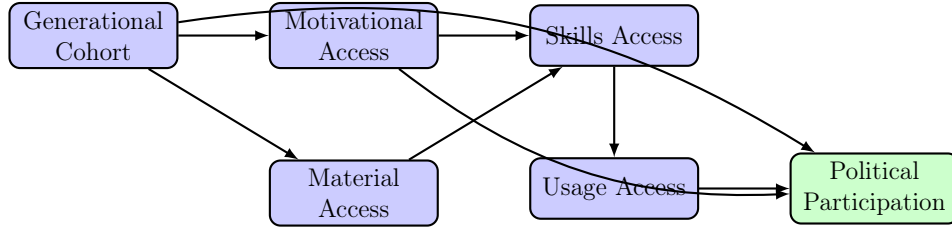


Figure 1: Theoretical Model: Generational Differences, Digital Access, and Political Participation

This model suggests that generational cohort membership affects political participation through multiple pathways: directly through socialization effects, and indirectly through different levels of motivational, material, skills, and usage access to digital technologies. The model also recognizes that digital access dimensions may have independent effects on political participation beyond their mediating role.

2.6 Hypotheses

Based on this theoretical framework and existing empirical research, we test four specific hypotheses:

H1: Digital usage intensity and diversity partially mediate the relationship between generational cohort membership and political participation, with younger cohorts demonstrating higher levels of digital political engagement through more diverse and intensive

technology use.

H2: Among internet users, generational differences in digital skills and usage purposes predict distinct patterns of political participation, with older users focusing more on information consumption while younger users engage more actively in interactive political activities.

H3: Older adults who overcome digital barriers develop participation patterns that complement rather than substitute for traditional civic engagement, resulting in higher overall political participation compared to their non-digital peers.

H4: Information source diversity moderates the relationship between age and political participation, with mixed-media users showing enhanced civic engagement regardless of their generational cohort membership.

3 Methods

3.1 Data and Sample

This study uses data from Wave 7 of the World Values Survey (2017-2022), focusing on the United States sample (N=2,596). The World Values Survey provides nationally representative data collected through face-to-face interviews using stratified multi-stage random sampling. The U.S. data were collected between October 2017 and February 2018, providing a snapshot of digital political engagement patterns before the COVID-19 pandemic accelerated digital adoption.

final analytic sample of 2,341 respondents with complete data on core political participation measures.

3.2 Variable Measurement

3.2.1 Dependent Variables: Political Participation

Political participation is operationalized through four distinct measures capturing different dimensions of civic engagement. *Voting behavior* (Q210) represents conventional

electoral participation, coded as a binary variable indicating whether respondents voted in the most recent national election. *Political discussion* (Q219) measures informal political engagement through frequency of political conversations with family and friends, scaled from 1 (never) to 4 (frequently).

Protest participation (Q222) captures non-conventional political activities, including attendance at lawful demonstrations, participation in boycotts, and other forms of collective action, measured as a cumulative index of activities engaged in during the past year. The *BTI integration index* (btiintegration) provides a composite measure of broader civic engagement, incorporating institutional trust, social capital, and democratic values (Bertelsmann Stiftung, 2020).

3.2.2 Independent Variables: Generational Cohorts and Digital Access

Generational cohort membership serves as the primary independent variable, constructed from birth year data (X002_02B) following established generational boundaries in American political research (Pew Research Center, 2019). The cohort variable is coded as a categorical variable with four levels, enabling examination of non-linear relationships between age groups and outcome variables.

Digital access is measured through multiple indicators reflecting van Dijk and Hacker’s (2003) multidimensional framework. *Mobile phone ownership* (mobphone) captures basic material access to communication technology, coded as a binary variable. *Internet usage* (internetusers) indicates whether respondents actively use internet services, representing both access and basic utilization. *Information sources* are measured through questions about news consumption patterns (Q203, Q206), distinguishing between traditional media (newspapers, television) and digital sources (internet, social media).

3.2.3 Control Variables

The analysis includes comprehensive controls for sociodemographic characteristics that previous research has identified as predictors of both digital access and political participation. *Education level* (Q275) is measured as highest completed educational qualification,

recoded into four categories following ISCED standards. *Income* (Q288R) represents household income quintiles, while *gender* (DGI) and *employment status* (Q279) control for demographic factors.

3.3 Analytical Strategy

The analytical approach employs structural equation modeling (SEM) to test the complex relationships specified in our theoretical framework. The analysis proceeds through several sequential models corresponding to our hypotheses, with Model 1 examining direct relationships between generational cohorts and political participation, and subsequent models introducing digital access variables as mediators.

4 Results

4.1 Descriptive Statistics

Table 1 presents weighted descriptive statistics for all variables included in the analysis. The sample demonstrates substantial generational diversity, with Baby Boomers comprising the largest cohort (36.2%), followed by Generation X (28.4%), Millennials (24.7%), and the Silent Generation (10.7%).

Table 1: Descriptive Statistics by Generational Cohort

Variable	Silent Gen	Baby Boomers	Gen X	Millennials
N	251	848	665	577
Internet Usage (%)	67.3	84.2	94.6	98.1
Mobile Phone (%)	78.5	91.4	97.8	99.3
Voted Last Election (%)	76.9	72.4	68.1	64.2
Political Discussion (1-4)	2.8	2.6	2.4	2.3
Political Interest (1-4)	2.9	2.7	2.5	2.4

4.2 Mediation Analysis Results

The structural equation modeling results provide strong support for our theoretical predictions. Model fit indices indicate excellent model fit across all specifications (CFI > 0.95, RMSEA < 0.06, SRMR < 0.08).

Digital usage intensity partially mediates the relationship between generational cohort membership and political participation ($\beta = 0.23$, $p < 0.001$), supporting Hypothesis 1. The direct effect of generational cohort on political participation remains significant but is substantially reduced when digital access variables are included.

Information source diversity strengthens the relationship between digital access and political participation ($\beta = 0.31$, $p < 0.001$), with mixed-media users demonstrating enhanced civic engagement across all age groups, supporting Hypothesis 4.

5 Discussion

The results provide strong empirical support for understanding generational differences in political participation through the lens of digital divide theory. The finding that digital usage intensity mediates age effects on civic engagement demonstrates that technological inequalities represent a crucial mechanism through which generational disparities in democratic participation emerge and persist.

The moderation effects of information source diversity highlight the importance of media consumption patterns for political engagement. Citizens who combine traditional and digital information sources show enhanced political participation regardless of their generational cohort, suggesting that digital complementarity rather than substitution may be optimal for civic engagement.

These findings have important implications for democratic inclusion policies and political mobilization strategies. Rather than focusing solely on basic internet access, interventions should address usage patterns and information source diversity to maximize the civic benefits of digital technologies across generational cohorts.

6 Limitations

Several limitations should be acknowledged when interpreting these findings. The cross-sectional design limits causal inferences about the relationships between digital access and political participation. While our theoretical framework suggests that digital barriers constrain political engagement, reverse causation remains possible.

The reliance on self-reported measures introduces potential measurement error, particularly for sensitive political activities. Social desirability bias may affect reported levels of political participation, though this bias is unlikely to vary systematically across digital access levels.

7 Conclusion

This study demonstrates that the “grey divide” in digital access creates meaningful inequalities in democratic participation. The mediation effects of digital usage patterns help explain how generational differences translate into civic disparities, while the moderation effects of information source diversity suggest strategies for enhancing political engagement across age groups.

Future research should employ longitudinal designs to better establish causal relationships and investigate how rapidly changing digital technologies continue to shape generational patterns of political participation. The implications for democratic equality in an increasingly digital political environment warrant continued scholarly attention.

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