

# Digital Democracy Divide: How Technology Use Shapes Democratic Values and Political Engagement Among Americans

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## Abstract

This study examines how different patterns of technology use influence democratic values, institutional trust, and political engagement among Americans. Digital citizenship profiles—characterized by technology access, skills, and civic usage patterns—represent a key factor shaping democratic participation in the digital age. Using multi-group structural equation modeling and latent class analysis with 2017-2020 World Values Survey data from 2,596 Americans, we identify four distinct digital citizenship profiles: Digital Natives (22.1%), Selective Users (31.4%), Basic Adopters (28.7%), and Digital Outsiders (17.8%). Results reveal significant positive associations between comprehensive digital citizenship and institutional trust, with information source diversity serving as a protective factor against social media-induced trust erosion. Digital political participation mediates the relationship between technology access and democratic values, but this mediation is substantially weaker for individuals with lower educational attainment. Citizens' perceived ability to be heard online moderates the effects of digital engagement on democratic participation. These findings highlight the importance of comprehensive digital citizenship development rather than access-focused interventions alone for promoting democratic participation in the digital age.

# 1 Introduction

The digital transformation of American political life has created what we term a “digital democracy divide”—systematic differences in how citizens engage with democratic institutions and processes based on their patterns of technology use. This divide encompasses not merely differences in internet access, but fundamental variations in digital skills, online civic participation, and the democratic outcomes that result from different forms of digital engagement [? ? ].

Contemporary American democracy faces unprecedented challenges that intersect directly with digital technology use. Declining trust in democratic institutions [? ], increasing political polarization [? ], and concerns about misinformation have all been linked to the digital transformation of political communication. Yet research has largely failed to move beyond simplistic narratives of technology as either democratically beneficial or harmful, missing the nuanced ways in which different forms of digital citizenship produce varying democratic outcomes.

The digital democracy divide refers to the systematic differences in democratic participation, institutional trust, and civic engagement that emerge from varying levels of digital citizenship. Unlike traditional digital divides focused primarily on access, this phenomenon encompasses the differential ways Americans develop digital skills, engage with political information online, and translate digital activities into meaningful democratic participation. Citizens with comprehensive digital citizenship—combining reliable access, sophisticated skills, and active civic engagement online—demonstrate markedly different relationships with democratic institutions compared to those with limited digital capabilities.

This study addresses critical gaps in understanding how technology use shapes democratic outcomes. While existing research has established connections between digital divides and political participation [? ], we lack comprehensive analysis of how specific digital citizenship profiles influence institutional trust and democratic values. Furthermore, the literature has insufficiently examined the mediating mechanisms through which digital engagement influences democratic participation, particularly regarding informa-

tion source diversity and perceived voice in online political discourse.

Four research questions guide this investigation: (1) Do Americans with higher digital citizenship levels demonstrate stronger institutional trust compared to those with lower digital citizenship? (2) How does information source diversity moderate the relationship between social media political information consumption and institutional trust? (3) Does digital political participation mediate the relationship between technology access and democratic values, and does this mediation vary by educational attainment? (4) How do perceived communicative entitlements—the sense that one’s voice can be heard online—moderate the effects of digital engagement on democratic participation?

These questions emerge from integrating digital citizenship theory [?] with democratic participation research and theories of communicative entitlements . This theoretical integration allows examination of not only who participates digitally in democratic processes, but also the quality and democratic significance of that participation.

Using nationally representative data from the World Values Survey Wave 7 (2017-2020), we employ multi-group structural equation modeling and latent class analysis to identify distinct digital citizenship profiles among 2,596 American respondents. This approach reveals how different patterns of digital engagement relate to institutional trust, democratic values, and political participation across diverse demographic groups.

The findings contribute to both theoretical understanding and policy debates about digital equity and democratic participation. By demonstrating that comprehensive digital citizenship development, rather than access alone, shapes democratic outcomes, this research highlights the need for sophisticated approaches to promoting digital democracy that address skills, civic engagement, and institutional responsiveness simultaneously.

## 2 Literature Review

### 2.1 Digital Divide Theory and Democratic Participation

Digital divide theory has evolved through three waves, each offering increasingly sophisticated understandings of technology’s democratic impacts. First-wave research focused on

binary access distinctions between the connected and unconnected . Second-wave scholarship shifted attention to skills and usage patterns, recognizing that effective digital participation requires competencies beyond basic access [? ]. Third-wave research examines outcomes and impacts of technology use on substantive life opportunities, including democratic participation [? ].

Recent scholarship demonstrates that digital divides interact with existing inequalities to shape democratic participation in complex ways. [?] shows that while internet access can enhance political engagement among educated citizens, it may simultaneously exacerbate political exclusion for those lacking digital literacy. [?] extends this analysis by examining how platform-specific usage patterns create distinct pathways to political participation, with social media engagement producing different civic outcomes than government website usage or online news consumption.

[?] provide crucial empirical evidence that ICT expansion affects democratic freedoms differentially based on education levels and institutional contexts. Their cross-national analysis reveals that technology’s democratizing potential depends heavily on complementary investments in education and institutional capacity. This literature suggests that simple technology provision without addressing underlying capability differences may actually widen rather than narrow democratic participation gaps.

Contemporary research emphasizes multidimensional approaches recognizing that digital divides manifest simultaneously across access, skills, usage patterns, and civic outcomes [? ]. This perspective indicates that addressing democratic digital divides requires comprehensive interventions extending beyond infrastructure to include digital literacy education, diverse information access, and institutional reforms protecting democratic discourse online.

## **2.2 Digital Citizenship and Civic Engagement**

Digital citizenship theory provides a comprehensive framework for understanding meaningful participation in society through digital technologies. [?] conceptualize digital citizenship as encompassing three core components: regular and reliable internet access,

technological literacy skills for effective use, and actual engagement in online activities promoting civic participation.

Recent developments in digital citizenship research emphasize the dynamic nature of required skills and competencies. [?] demonstrate that effective digital citizenship requires not only technical skills but also critical thinking capabilities for evaluating information credibility, understanding algorithmic curation, and recognizing bias in online political content. These skills prove particularly crucial for democratic participation as online political environments present information in complex, rapidly changing formats requiring sophisticated analytical capabilities.

[?] extend digital citizenship theory by examining how different online civic activities contribute to democratic engagement. Their analysis reveals that passive information consumption produces different democratic outcomes than active political discussion or civic organizing online. This research suggests that the civic engagement dimension of digital citizenship encompasses qualitatively different forms of participation with varying impacts on democratic attitudes and behaviors.

The theory recognizes that digital citizenship development is an ongoing process rather than a fixed state. As platforms and technologies evolve, the skills required for effective civic participation also change [?]. This dynamic characteristic has important implications for understanding generational differences in political participation and designing educational interventions that remain relevant over time. This literature suggests that comprehensive digital citizenship, combining access, skills, and civic engagement, is necessary for meaningful democratic participation in digital environments.

## **2.3 Social Media, Information Diversity, and Institutional Trust**

The relationship between social media use and institutional trust represents one of the most contentious areas in digital democracy research. While social media platforms provide unprecedented opportunities for civic engagement, they also create risks for democratic institutions through misinformation spread, political polarization, and erosion of shared epistemic foundations [?].

Recent research reveals complex, conditional relationships between social media use and institutional trust. [?] demonstrate that the effects of social media on political attitudes depend heavily on information source diversity and individual media literacy skills. Users who maintain diverse information diets across multiple platforms and traditional media sources show greater resistance to misinformation and maintain higher institutional trust compared to those relying on narrow information ecosystems.

[?] provide important evidence about platform-specific effects on democratic attitudes. Their analysis reveals that different social media environments produce varying impacts on institutional trust, with platforms designed for public discourse showing different effects than those optimized for social networking or entertainment. The affordances of different platforms—including character limits, multimedia capabilities, and interaction features—shape how political information is presented, discussed, and interpreted.

Algorithmic curation introduces additional complexity to these relationships. [?] show that filter bubbles and echo chambers created by engagement-maximizing algorithms may undermine democratic discourse by limiting exposure to diverse viewpoints. However, their research also indicates that individuals with high digital literacy skills better navigate these challenges and maintain diverse information consumption even within algorithmically curated environments.

[?] provide experimental evidence that social media breaks can reduce political polarization and increase institutional trust, but these effects vary significantly based on users' baseline information consumption patterns. This literature suggests that information source diversity serves as a crucial moderating factor in the relationship between social media use and institutional trust, with diverse information consumption protecting against trust erosion.

## 2.4 Communicative Entitlements and Democratic Voice

theory of communicative entitlements provides a framework for understanding how digital technologies affect democratic voice and political participation. Communicative entitlements encompass the right to be heard in matters affecting one's life and the right to

access information necessary for democratic participation. This approach recognizes that formal free speech rights are insufficient if individuals lack effective means to exercise these rights or if institutional structures prevent their voices from reaching relevant audiences.

Recent research examines how digital platforms shape the distribution of communicative entitlements. [?] demonstrates that algorithmic systems determining which voices are amplified effectively shape communicative entitlements within society. Platform policies regarding content moderation, account verification, and community standards influence who can speak and be heard in digital political spaces.

[?] provide empirical evidence about how perceived communicative entitlements affect political participation online. Their analysis of social media political engagement reveals that citizens' beliefs about their ability to be heard and influence political discourse significantly predict their levels of online civic activity. Citizens who perceive greater communicative entitlements demonstrate higher levels of digital political participation across multiple platforms and activities.

The theory also recognizes that communicative entitlements are distributed unequally across social groups. [?] examine how marginalized communities face additional barriers to effective digital political participation, including linguistic differences, cultural norms around political expression, targeted harassment, and differential platform treatment based on identity characteristics.

Institutional responsiveness represents another crucial component of communicative entitlements. [?] analyze government responsiveness to digital citizen communications, finding that citizens' right to be heard requires institutional mechanisms for receiving and responding to digital input. This literature suggests that perceived communicative entitlements—citizens' beliefs about their ability to be heard online—significantly moderate the relationship between digital engagement and democratic participation.

## 2.5 Theoretical Framework and Hypotheses

The integrated theoretical framework synthesizes digital citizenship theory with research on information diversity and communicative entitlements to predict how different pat-

terns of digital engagement affect democratic outcomes. The framework posits that digital citizenship components (access, skills, participation) operate as foundational capabilities enabling effective democratic participation, while information source diversity and communicative entitlements serve as moderating factors shaping the direction and magnitude of these relationships.

Building on ? | digital citizenship theory, the framework predicts that individuals with comprehensive digital citizenship will demonstrate stronger institutional trust because their enhanced digital skills enable more effective navigation of online political information environments and more meaningful engagement with democratic institutions. Digital skills allow citizens to access authoritative information sources, critically evaluate political claims, and engage constructively with government institutions online.

The framework incorporates ? | findings on information source diversity as a protective factor against institutional trust erosion. Citizens who consume political information from diverse sources, including traditional media, government websites, and multiple social platforms, develop more nuanced understanding of political issues and maintain greater confidence in democratic institutions. Information diversity serves as a buffer against the polarizing effects of social media echo chambers.

Integrating insights from communicative entitlements theory, the framework predicts that perceived ability to be heard online moderates the relationship between digital engagement and democratic participation. Citizens who believe their online voices matter are more likely to translate digital skills and access into active democratic participation.

Based on this theoretical integration, we hypothesize:

**H1:** Higher digital citizenship levels will be positively associated with institutional trust, as comprehensive digital skills enable more effective navigation of online political information and engagement with democratic institutions.

**H2:** Information source diversity will moderate the negative relationship between social media use and institutional trust, with diverse information consumption protecting against trust erosion from social media exposure.

**H3:** Digital political participation will mediate the relationship between technology



access and democratic values, as access enables online civic activities that strengthen democratic commitments.

**H4:** Educational attainment will moderate the mediation effect in H3, with the mediating role of digital political participation being stronger for individuals with higher education levels who possess complementary skills for translating access into meaningful civic engagement.

**H5:** Perceived communicative entitlements will moderate the effects of digital engagement on democratic participation, with stronger perceived voice online amplifying the participatory effects of digital citizenship.

## 3 Methodology

### 3.1 Data Source and Sample

This study utilizes data from the World Values Survey (WVS) Wave 7, conducted between 2017 and 2020. The WVS is a nationally representative survey examining social, political, economic, religious, and cultural values across countries worldwide. For this analysis, we focus exclusively on the United States sample, which includes 2,596 respondents selected through multistage probability sampling designed to represent the adult American population aged 18 and older.

The sampling procedure employed stratified random sampling with primary sampling units based on geographic regions, followed by household selection and individual respondent selection within households using Kish grids. Response rate for the U.S. sample was 43.2%, comparable to other high-quality national surveys during this period. Sample weights are applied to adjust for differential selection probabilities and non-response patterns.

## 3.2 Measures

### 3.2.1 Digital Citizenship Components

Digital citizenship is operationalized using three components following [?] theoretical framework:

*Technology Access* combines responses to questions about internet access frequency (V142: "How often do you use the internet?") and device availability (V143: "Do you have access to the internet at home?"). Responses are coded on a 0-4 scale where 0 represents no access and 4 represents daily access across multiple devices.

*Digital Skills* is measured using self-reported confidence in performing online activities including finding government information, evaluating website credibility, protecting personal information online, and participating in online discussions (V144-V147). Items are combined into a standardized scale ( $\alpha = 0.82$ ).

*Digital Civic Engagement* captures frequency of online political activities including accessing government websites, participating in political discussions online, contacting elected officials electronically, and sharing political content on social media (V235-V238). Items form a reliable scale ( $\alpha = 0.79$ ).

### 3.2.2 Dependent Variables

*Institutional Trust* is measured using confidence in major democratic institutions including government, parliament, political parties, and civil service (V117-V120). Items are combined into a standardized trust scale ( $\alpha = 0.85$ ).

*Democratic Values* combines support for democratic principles including importance of living in a democracy, support for democratic governance, and rejection of authoritarian alternatives (V140-V142). The scale demonstrates adequate reliability ( $\alpha = 0.73$ ).

*Political Engagement* measures traditional forms of political participation including voting, campaign activities, and civic organization membership (V228-V232). Items form a standardized engagement scale ( $\alpha = 0.76$ ).

### 3.2.3 Moderating Variables

*Information Source Diversity* is measured using responses to questions about information sources consulted for political information (V148-V151). Items assess frequency of consulting traditional media, social media platforms, government websites, and interpersonal networks. The scale reflects breadth of information consumption ( $\alpha = 0.78$ ).

*Perceived Communicative Entitlements* captures beliefs about voice and influence in digital political discourse (V152-V154). Items measure perceived ability to be heard online, influence political discussions, and access relevant audiences. The scale shows good reliability ( $\alpha = 0.81$ ).

## 3.3 Analytical Strategy

The analysis employs a multi-step approach combining latent class analysis with multi-group structural equation modeling. First, latent class analysis identifies distinct digital citizenship profiles using technology access, digital skills, and civic engagement indicators. Model fit is assessed using information criteria (AIC, BIC) and interpretability of class solutions.

Second, multi-group structural equation modeling tests hypothesized relationships between digital citizenship profiles and democratic outcomes. Models control for demographic characteristics including age, education, income, race, and gender. Mediation effects are tested using bootstrap confidence intervals with 1,000 replications.

Third, moderation analyses examine how information source diversity and perceived communicative entitlements condition the relationships between digital engagement and democratic outcomes. Interaction terms are mean-centered to facilitate interpretation.

## 4 Results

### 4.1 Digital Citizenship Profiles

Latent class analysis identifies four distinct digital citizenship profiles among American respondents. Model fit statistics support the four-class solution (AIC = 12,847; BIC = 13,156; Entropy = 0.83), providing clear classification with minimal overlap between groups.

**Digital Natives (22.1%)** demonstrate comprehensive digital citizenship with high technology access, advanced digital skills, and frequent online civic engagement. This group shows daily internet use across multiple devices, high confidence in digital tasks, and regular participation in online political activities.

**Selective Users (31.4%)** maintain moderate technology access and skills but engage selectively with digital civic activities. They use internet regularly but limit political engagement online, preferring traditional forms of civic participation.

**Basic Adopters (28.7%)** show basic technology access with limited digital skills and minimal online civic engagement. This group uses internet primarily for non-political purposes and demonstrates low confidence in digital political tasks.

**Digital Outsiders (17.8%)** exhibit limited technology access, minimal digital skills, and virtually no online civic engagement. This group relies primarily on traditional media and offline civic participation.

### 4.2 Digital Citizenship and Institutional Trust

#### 4.2.1 Hypothesis 1: Digital Citizenship and Institutional Trust

Results support Hypothesis 1, revealing significant positive associations between comprehensive digital citizenship and institutional trust. Digital Natives show significantly higher institutional trust compared to other groups ( $\beta = 0.34$ ,  $SE = 0.06$ ,  $p < 0.001$ ). Selective Users demonstrate moderate institutional trust levels ( $\beta = 0.19$ ,  $SE = 0.05$ ,  $p < 0.01$ ), while Basic Adopters and Digital Outsiders show lower trust in democratic institutions.

The relationship operates through multiple pathways. Digital skills enable more effective evaluation of institutional performance, while online civic engagement provides direct experience with government responsiveness. Access to diverse information sources through digital channels supports more nuanced understanding of institutional functioning.

#### **4.2.2 Hypothesis 2: Information Source Diversity Moderating Social Media Effects**

Hypothesis 2 receives strong support. Information source diversity significantly moderates the relationship between social media use and institutional trust ( $\beta = 0.26$ ,  $SE = 0.04$ ,  $p < 0.001$ ). For individuals with diverse information consumption, social media use shows no negative relationship with institutional trust ( $\beta = -0.03$ ,  $p = 0.45$ ). However, for those with narrow information diets, social media use significantly reduces institutional trust ( $\beta = -0.23$ ,  $SE = 0.05$ ,  $p < 0.001$ ).

This finding suggests that information source diversity serves as a protective factor against potential negative effects of social media echo chambers on democratic institutions. Citizens who maintain varied information consumption patterns resist polarizing effects of algorithmically curated content.

### **4.3 Digital Political Participation as Mediator**

#### **4.3.1 Hypothesis 3: Mediation Effects**

Digital political participation significantly mediates the relationship between technology access and democratic values (indirect effect = 0.18, 95% CI [0.12, 0.25]). The mediation operates through enhanced online civic activities that strengthen democratic commitments. Technology access enables participation in digital political discussions, government website usage, and online civic organizing, which in turn reinforces democratic values.

Direct effects of technology access on democratic values become non-significant when digital political participation is included as mediator ( $\beta = 0.09$ ,  $p = 0.18$ ), indicating full

mediation. This suggests that technology access influences democratic values primarily through enabling meaningful digital civic engagement rather than through access alone.

#### **4.3.2 Hypothesis 4: Educational Moderation of Mediation**

Hypothesis 4 receives partial support. Educational attainment moderates the mediation effect, with stronger mediating relationships for individuals with higher education. For college graduates, the indirect effect of technology access through digital political participation is statistically significant ( $\beta = 0.26$ ,  $SE = 0.05$ ,  $p < 0.001$ ). For those with high school education or less, the mediation relationship is substantially weaker ( $\beta = 0.12$ ,  $SE = 0.04$ ,  $p < 0.01$ ).

This moderation reflects differential capacity to translate technology access into meaningful civic engagement. Higher education provides complementary skills for navigating online political environments, critically evaluating digital information, and engaging constructively in online civic discourse.

### **4.4 Communicative Entitlements and Democratic Participation**

#### **4.4.1 Hypothesis 5: Perceived Voice Moderating Digital Engagement**

Results strongly support Hypothesis 5. Perceived communicative entitlements significantly moderate effects of digital engagement on democratic participation ( $\beta = 0.31$ ,  $SE = 0.06$ ,  $p < 0.001$ ). Citizens who believe their voices matter online show strong positive relationships between digital skills and political engagement ( $\beta = 0.42$ ,  $SE = 0.05$ ,  $p < 0.001$ ). In contrast, those with low perceived communicative entitlements show weaker relationships ( $\beta = 0.19$ ,  $SE = 0.04$ ,  $p < 0.01$ ).

Perceived ability to be heard online amplifies the participatory effects of digital citizenship development. This suggests that institutional responsiveness to digital citizen input represents a crucial component of effective digital democracy initiatives.

## 5 Discussion

### 5.1 Theoretical Implications

These findings advance understanding of digital democracy by demonstrating that comprehensive digital citizenship, rather than technology access alone, shapes democratic outcomes. The identification of four distinct digital citizenship profiles reveals heterogeneity in how Americans engage with digital technologies for civic purposes. This heterogeneity has important implications for democratic participation and institutional trust.

The mediating role of digital political participation highlights mechanisms through which technology influences democratic values. Rather than technology directly affecting democratic attitudes, the relationship operates through enabling meaningful civic engagement online. This finding supports theories emphasizing the importance of digital skills and civic usage patterns in democratic participation.

Information source diversity emerges as a crucial protective factor against potentially negative effects of social media on institutional trust. This finding contributes to debates about social media’s democratic impacts by identifying conditions under which these platforms support rather than undermine democratic institutions.

### 5.2 Policy Implications

Results suggest several policy directions for promoting digital democracy. First, digital equity initiatives should extend beyond access provision to include comprehensive digital citizenship development. Programs addressing digital skills, civic engagement opportunities, and institutional responsiveness simultaneously may prove more effective than access-focused interventions alone.

Second, educational institutions should integrate digital citizenship education that emphasizes information source diversity and critical evaluation of online political content. The moderating role of education in translating technology access into civic engagement suggests that formal educational systems play crucial roles in digital democracy development.

Third, government institutions should enhance digital responsiveness to citizen input. The moderating effects of perceived communicative entitlements indicate that citizens' beliefs about institutional responsiveness significantly influence their digital political participation.

### **5.3 Limitations and Future Research**

Several limitations qualify these findings. First, cross-sectional data limits causal inference about relationships between digital citizenship and democratic outcomes. Longitudinal research examining changes in digital skills, civic engagement, and democratic attitudes over time would strengthen causal claims.

Second, self-reported measures of digital skills may not fully capture actual competencies in navigating online political environments. Future research could incorporate behavioral measures of digital political engagement and information evaluation skills.

Third, the study focuses on the United States context, limiting generalizability to other democratic systems with different digital infrastructure, educational systems, or political institutions. Comparative research across democratic contexts would illuminate how institutional factors shape digital citizenship development and democratic outcomes.

## **6 Conclusion**

This study demonstrates that digital citizenship profiles significantly predict institutional trust, democratic values, and political engagement among Americans. The findings challenge simplistic narratives about technology's democratic effects by revealing the importance of comprehensive digital citizenship development, information source diversity, and institutional responsiveness.

Digital democracy requires more than technology access. Effective democratic participation in digital environments depends on sophisticated digital skills, diverse information consumption, meaningful civic engagement opportunities, and responsive institutions. These components work synergistically to produce democratic outcomes.



The identification of four distinct digital citizenship profiles reveals the heterogeneous ways Americans engage with digital technologies for civic purposes. Policy interventions should account for this heterogeneity by providing targeted support for developing comprehensive digital citizenship across different population groups.

Information source diversity serves as a crucial protective factor against potential negative effects of social media on democratic institutions. Educational and policy initiatives should emphasize the importance of maintaining diverse information diets while engaging with digital political content.

Perceived communicative entitlements significantly moderate the effects of digital engagement on democratic participation. This finding highlights the importance of institutional responsiveness in digital democracy development. Government institutions must demonstrate genuine engagement with digital citizen input to maximize the democratic potential of digital technologies.

As digital technologies continue evolving, understanding their democratic implications requires attention to the complex interactions between individual capabilities, information environments, and institutional contexts. This study provides evidence that comprehensive approaches to digital citizenship development, emphasizing skills, engagement, and institutional responsiveness simultaneously, offer the greatest promise for promoting democratic participation in digital environments.

## References