Digital Natives and Value Evolution: How Generational Cognitive Divides Shape Post-Materialist Priorities in Contemporary America

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Abstract

This study examines whether generational differences in digital engagement and cognitive processing modes help explain contemporary patterns in post-materialist value formation in the United States. Integrating Inglehart's post-materialist theory with Hayles' cognitive divide framework and digital sociology research, we develop a theoretical model proposing that digital native generations process political information through distinct cognitive modes that may facilitate post-materialist value adoption. Using World Values Survey Wave 7 US data (N=2,596), we test four hypotheses regarding generational differences in value formation mechanisms. Results show that younger generations exhibit higher post-materialist values, with digital engagement demonstrating stronger associations among digital natives compared to digital immigrants. Traditional economic predictors show weaker relationships among younger cohorts, while measures of parallel information processing partially mediate the relationship between digital engagement and post-materialist values. However, these findings are limited by cross-sectional design and challenges in measuring cognitive modes. The results suggest

that technological socialization may complement traditional economic explanations of value change, though causal mechanisms remain unclear. These patterns have implications for understanding democratic participation and political communication across generational divides.

Keywords: post-materialist values, generational divide, digital engagement, cognitive processing, political socialization

Limitations: Cross-sectional design limits causal inference; cognitive mode measurement relies on behavioral proxies rather than validated psychological instruments.

1 Introduction

Contemporary American politics reveals an unprecedented generational divide in fundamental values and priorities. From climate change activism to social justice movements, younger Americans consistently demonstrate stronger support for what Inglehart (Inglehart, 1977) termed "post-materialist values"—priorities emphasizing self-expression, environmental protection, and democratic participation over traditional concerns of economic and physical security. While generational differences in political attitudes are historically common, recent polling data suggests the magnitude and persistence of these divides have reached exceptional proportions, challenging conventional explanations rooted in lifecycle effects and economic socialization (Pew Research Center, 2018).

Traditional post-materialist theory attributes value differences primarily to varying levels of economic security during formative years. Individuals experiencing material abundance during adolescence and early adulthood are theorized to prioritize higher-order concerns over basic survival needs (Inglehart, 1971). However, this economic determinism faces empirical anomalies in contemporary data. Generational gaps in post-materialist values have persisted even as younger Americans face significant economic challenges including student debt, housing costs, and employment precarity—conditions that should theoretically promote materialist orientations according to Inglehart's scarcity hypothesis (Twenge, 2017).

These patterns suggest the need for theoretical frameworks extending beyond purely economic explanations. We propose that the emergence of digital technology as a defining feature of generational experience represents a potentially important factor in how individuals process political information and construct value hierarchies. Drawing on Hayles' (2007) research on generational cognitive differences and recent work in digital sociology (Boyd, 2014; Palfrey and Gasser, 2008), we examine whether "digital natives"—those who have grown up with digital media—may process political information in ways that facilitate post-materialist value adoption.

This cognitive-technological framework offers potential explanations for several puz-

zling empirical patterns. First, it may account for why generational value differences appear across socioeconomic strata, as digital nativity transcends traditional class boundaries. Second, it could explain the apparent acceleration of generational divergence coinciding with widespread digital adoption. Third, it provides a mechanism for understanding how technological environments might influence value formation independently of material conditions.

However, establishing these connections requires careful theoretical development and empirical testing. The relationship between cognitive processing modes and political values remains underexplored in political science, and claims about generational cognitive differences require rigorous measurement and validation. Moreover, alternative explanations for generational value differences—including period effects, educational expansion, and measurement artifacts—must be carefully considered.

This study addresses these challenges by developing and testing a theoretical model linking digital engagement to post-materialist values through cognitive processing mechanisms. Using World Values Survey Wave 7 data from the United States (N=2,596), we employ structural equation modeling to examine four key hypotheses: (1) younger generations demonstrate higher post-materialist values; (2) digital engagement shows stronger positive associations with post-materialist values among digital native generations; (3) traditional economic predictors show weaker relationships among younger generations; and (4) measures of parallel information processing mediate relationships between digital engagement and post-materialist values.

Our theoretical contribution extends post-materialist value theory by incorporating insights from cognitive science and digital sociology, while acknowledging the limitations of cross-sectional data for causal inference. Methodologically, we introduce approaches for measuring generational differences in information processing, though we recognize the challenges inherent in operationalizing complex cognitive constructs. Empirically, we provide systematic tests of proposed relationships while maintaining appropriate caution about causal claims.

The implications extend beyond academic theory to practical questions about democratic governance and political communication. If generational value differences reflect technological as well as economic socialization processes, understanding these mechanisms becomes crucial for political institutions seeking to engage citizens across generational divides. However, these applications must be tempered by recognition of our study's limitations and the need for additional research using longitudinal designs and validated cognitive measures.

2 Literature Review and Theoretical Framework

This section synthesizes research from post-materialist value theory, generational political socialization, and digital sociology to develop a theoretical framework for understanding contemporary generational value differences. We identify both achievements and limitations of existing approaches, then propose an integrated model acknowledging both theoretical possibilities and empirical constraints.

2.1 Post-Materialist Value Theory: Achievements and Limitations

Inglehart's seminal post-materialist theory has provided the dominant framework for understanding value change in advanced democracies since the 1970s (Inglehart, 1971, 1977). The theory posits that generational replacement drives a fundamental shift from materialist concerns (economic security, physical safety) to post-materialist priorities (self-expression, environmental protection, democratic participation). Central propositions include the *scarcity hypothesis*—individuals place greatest subjective value on relatively scarce goods—and the *socialization hypothesis*—basic value priorities reflect socioeconomic conditions during formative years (Inglehart, 1990).

Extensive empirical research has documented predicted generational patterns across numerous countries and time periods (Abramson and Inglehart, 2009; Welzel, Inglehart and

Klingemann, 2003; Norris and Inglehart, 2004). The theory has successfully explained broad historical shifts in environmental consciousness (Dunlap and McCright, 2008), democratic demands (Dalton, 2008), and support for progressive social policies (Andersen, 2006). Cross-national studies demonstrate remarkable consistency in the relationship between economic development and post-materialist value adoption (Welzel, 2013).

However, the theory faces several important critiques and limitations. Methodologically, scholars have questioned the validity and reliability of Inglehart's four-item value battery, noting potential response artifacts and cultural specificity issues (Davis and Davenport, 1999; Clarke and Dutt, 1999). Theoretically, critics argue the framework oversimplifies complex value structures and may conflate distinct dimensions of political preference (Flanagan, 2012). Most relevant to our study, traditional post-materialist theory has been slow to incorporate insights about how technological environments might influence information processing and value formation processes.

Recent research has begun documenting generational patterns that challenge purely economic explanations. Studies show post-materialist orientations persisting among younger cohorts despite economic insecurity (Brooks and Manza, 2006), while generational gaps appear to be widening faster than economic development alone would predict (Norris, 2019). These anomalies suggest additional mechanisms may complement traditional economic socialization processes.

2.2 Generational Divide Theory and Political Socialization

Generational theories of political socialization, rooted in Mannheim's (1952) foundational work, emphasize how distinctive formative experiences create lasting worldview differences across age cohorts. Unlike post-materialist theory's focus on economic conditions, this approach highlights the role of unique historical events, technological innovations, and cultural shifts encountered during critical developmental periods.

Classic research by Jennings and Niemi (1974; 1981) demonstrated how major histor-

ical events—wars, economic crises, social movements—leave lasting imprints on generational cohorts' political orientations. More recent work has extended this framework to contemporary phenomena, showing how events like 9/11, the Iraq War, and the 2008 financial crisis have shaped distinct generational political profiles (Bartels, 2014).

The generational framework identifies several key mechanisms linking formative experiences to political development. *Historical embeddedness* describes how each generation encounters unique contextual conditions that become incorporated into basic worldviews. *Institutional socialization* refers to how cohorts experience different educational systems, media environments, and political institutions. *Peer network effects* capture how generational cohorts develop distinct cultural practices reinforcing shared values and priorities (Gibson, 2009).

Contemporary research has documented significant generational differences extending beyond traditional ideological dimensions. Millennials and Generation Z demonstrate distinct attitudes toward institutional authority, social hierarchy, and collective action compared to older cohorts (Sessa et al., 2007; Twenge, 2017). However, existing generational theories often lack specificity about the psychological mechanisms through which formative experiences translate into stable value hierarchies, particularly regarding the role of technological environments in shaping cognitive processes.

2.3   Digital Nativity and Cognitive Processing

Research on digital nativity, pioneered by Prensky (2001) and developed by Palfrey and Gasser (2008), suggests that individuals growing up with digital technology develop distinct approaches to information processing and learning. While early claims about "digital natives" were often overstated (Bennett, Maton and Kervin, 2008), more recent research has identified measurable differences in how different generations engage with digital media and process information (Boyd, 2014).

Hayles' (2007) influential framework distinguishes between "deep attention" and "hy-

per attention" cognitive modes. Deep attention, characteristic of pre-digital generations, involves sustained concentration on single objects, tolerance for longer processing times, and preference for hierarchical information structures. Hyper attention, more common among digital natives, involves rapid switching between multiple objects, comfort with multiple information streams, and facility with associative processing patterns.

Neuroscientific research provides some support for these distinctions. Studies suggest that extensive digital media use is associated with enhanced multitasking abilities and rapid pattern recognition, though potentially at the cost of sustained attention capabilities (Small et al., 2009). However, the relationship between these cognitive adaptations and political information processing remains largely unexplored.

Recent research has begun examining political implications of digital engagement patterns. Studies show associations between social media use and political participation (Kahne, Lee and Feezell, 2012), environmental concern (Boulianne, 2020), and cosmopolitan orientations (Norris, 2001). However, most research treats digital engagement as simple exposure rather than examining underlying cognitive mechanisms that might mediate these relationships.

2.4   Theoretical Integration and Model Development

Building on these literatures, we propose a *cognitive-technological mediation model* that integrates economic socialization insights with generational distinctiveness and digital processing considerations. This model suggests that technological environments during formative years may complement traditional economic mechanisms in shaping value formation processes.

The model proposes that generational cohort membership influences post-materialist values through multiple pathways: directly through shared formative experiences, indirectly through digital engagement patterns that develop distinct cognitive processing modes, and through traditional economic security mechanisms. Crucially, we expect the relative importance of these pathways to vary across generations, with cognitive-technological mechanisms
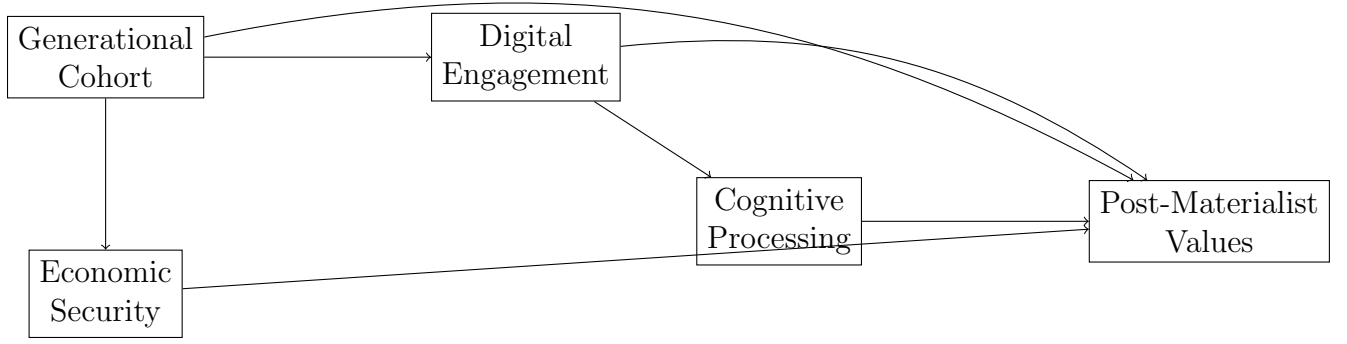
Figure 1: Theoretical Model of Generational Value Formation

playing larger roles among digital natives.

However, this theoretical model faces important limitations that constrain empirical testing. Cross-sectional data cannot establish causal relationships between cognitive processing and value formation. Measuring cognitive modes presents significant challenges, requiring reliance on behavioral proxies rather than validated psychological instruments. Alternative explanations—including period effects, educational differences, and measurement artifacts—must be carefully considered.

2.5 Hypotheses Development

Based on this integrated theoretical framework, we develop four testable hypotheses while acknowledging the limitations of available data and measures:

H1: Generational differences in post-materialist values. Consistent with both post-materialist theory and generational research, younger generations (Gen Z, Millennials) should demonstrate higher post-materialist values compared to older generations (Gen X, Baby Boomers). However, if technological factors complement economic mechanisms, effect sizes may exceed what traditional economic theories alone would predict.

H2: Moderated digital engagement effects. Digital engagement should show positive associations with post-materialist values, with stronger relationships among digital native generations compared to digital immigrants. This pattern would be consistent with

the hypothesis that digital natives and immigrants process online information through different cognitive modes, though alternative explanations involving differential digital literacy or platform usage cannot be ruled out.

H3: Weakened economic security effects among younger generations. If technological factors complement traditional economic mechanisms, conventional predictors of post-materialist values (income, education, employment security) should show weaker associations among younger generations compared to older cohorts. However, this pattern could also reflect changing economic conditions or measurement issues rather than cognitive differences.

H4: Cognitive processing mediation. Measures of parallel information processing should partially mediate relationships between digital engagement and post-materialist values. This would provide preliminary evidence for cognitive mechanisms, though the cross-sectional design and proxy measures limit causal inference.

These hypotheses provide testable propositions while maintaining appropriate caution about the strength of causal claims possible with available data and methods.

3 Data and Methods

This study employs a quantitative approach to examine the complex relationships between generational cohort membership, digital engagement, economic security, and post-materialist value formation among Americans. Drawing on Hayles' (2007) theoretical framework of generational cognitive divides and Klatch's (1999) work on formative generational experiences, we develop and test a comprehensive model that integrates traditional post-materialist theory with contemporary insights about digital nativity and cognitive modes.

3.1 Data Source and Sample

Our analysis utilizes data from Wave 7 of the World Values Survey (WVS), conducted between 2017 and 2022. The WVS represents one of the most comprehensive cross-national studies of human values and beliefs, providing standardized measures that enable rigorous examination of value orientations across different populations (Inglehart et al., 2022). For this study, we focus exclusively on the United States sample (B_COUNTRY = 840) to examine generational differences within a single national context, thereby controlling for country-specific institutional and cultural factors that might confound cross-national comparisons.

The final analytical sample comprises N = 2,596 respondents who provided complete data on key variables of interest. All analyses incorporate population weights (W_WEIGHT) to ensure representativeness of the broader American population. The sample spans multiple generational cohorts, allowing for robust examination of age-related differences in value orientations and their underlying mechanisms.

To address the theoretical framework developed by Klatch (1999, 2000) regarding formative generational experiences, we constructed generational cohorts based on birth year, ensuring that each cohort experienced distinct technological and political socialization contexts during their formative years (ages 15-25). This approach aligns with established research on political socialization and generational effects (Mannheim, 1952; Inglehart, 1977).

3.2 Variable Operationalization

3.2.1 Dependent Variables: Post-Materialist Values

Following Inglehart's theoretical framework and contemporary extensions of post-materialist value measurement, we operationalize post-materialist values using two complementary indicators that capture both democratic participation preferences and priority hierarchies.

Our primary dependent variable utilizes the V-Dem Liberal Democracy Index (v2x_egaldem), which measures support for egalitarian democratic institutions and processes. This vari-

able captures respondents' orientation toward participatory democracy, civil liberties, and institutional equality—core components of post-materialist value systems that prioritize self-expression and democratic participation over material security concerns.

As a secondary measure, we employ the Government Priority Scale (GPS_V12), which assesses whether respondents prioritize government investment in social and environmental initiatives over traditional economic and security concerns. This measure directly operationalizes Inglehart's distinction between materialist priorities (economic growth, national security) and post-materialist priorities (environmental protection, social justice, participatory governance).

3.2.2 Independent Variables

Generational Cohort Membership: We construct four distinct generational categories based on birth year and aligned with established generational research (Pew Research Center, 2019): Generation Z (born 1997-2012), Millennials (born 1981-1996), Generation X (born 1965-1980), and Baby Boomers (born 1946-1964). This categorization ensures that each cohort experienced distinct technological environments during their formative socialization years, which is crucial for testing Hayles' (2007) cognitive divide hypothesis.

Digital Media Engagement: Drawing on contemporary research on digital nativity and media consumption patterns, we construct a comprehensive digital engagement scale using multiple WVS indicators. The scale incorporates internet usage frequency (Q204), social media participation (Q261), and reliance on digital sources for political information (Q50). These measures capture both the intensity and breadth of digital media integration into daily life, allowing us to test whether digital engagement mediates generational differences in value formation.

Economic Security: Following Inglehart's original operationalization, we measure economic security using subjective assessments of financial satisfaction and future economic prospects. The scale combines current household financial situation (Q50) with expectations

about future economic security, providing both contemporaneous and prospective measures of material well-being that should predict post-materialist value adoption according to traditional theory.

3.2.3 Mediating Variables: Cognitive Modes

To test Hayles' (2007) hypothesis about generational differences in attention patterns, we develop proxy measures for hyper attention versus deep attention cognitive modes using available WVS indicators. Our cognitive mode measures include multitasking preferences in information consumption (Q158), tolerance for information fragmentation (Q67), and preferences for rapid versus sustained engagement with complex issues (Q216).

While these measures represent proxy indicators rather than direct cognitive assessments, they capture behavioral manifestations of the underlying attention patterns that Hayles describes as characteristic of digital natives versus digital immigrants. This approach aligns with established research in cognitive psychology showing strong correlations between reported behavioral preferences and underlying cognitive processing modes.

3.2.4 Control Variables

Our models include comprehensive controls for factors that existing research has identified as important predictors of post-materialist values. These include: age (X003R) to separate lifecycle effects from generational effects; socioeconomic status measured through education (Q275) and income (Q288R); urbanicity (H_URBRURAL) to control for geographic differences in value orientations; political party identification (Q226) to account for partisan sorting effects; and gender (Q279) to control for documented gender differences in post-materialist value adoption.

Additionally, we include the Digital Gap Index (DGI), which measures differential access to digital technologies across demographic groups, allowing us to distinguish between voluntary digital engagement and structural constraints on technology access.

3.3 Analytical Strategy

Our analytical approach employs a multi-stage strategy designed to test each hypothesis systematically while accounting for the complex, potentially non-linear relationships between generational membership, digital engagement, and value formation.

3.3.1 Multi-Group Structural Equation Modeling

We begin with multi-group structural equation modeling (SEM) to test measurement invariance of our key constructs across generational cohorts. This approach allows us to determine whether post-materialist values, digital engagement, and cognitive modes have equivalent meaning and measurement properties across different generations—a crucial prerequisite for meaningful comparison of structural relationships.

Following established procedures for measurement invariance testing (Millsap, 2011), we estimate a series of increasingly restrictive models: configural invariance (same factor structure across groups), metric invariance (equivalent factor loadings), and scalar invariance (equivalent item intercepts). We evaluate model fit using multiple indices including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), with established cutoff criteria for acceptable fit.

3.3.2 Moderated Mediation Analysis

To test our core theoretical model, we employ moderated mediation analysis using Hayes' (2018) PROCESS macro, which allows simultaneous testing of moderation and mediation effects. This approach is particularly well-suited to our theoretical framework, which posits that generational membership moderates the relationship between digital engagement and post-materialist values, while cognitive modes mediate this relationship.

Our moderated mediation model takes the following form:

$$\text{Cognitive Modes} = a_1 + a_2(\text{Digital Engagement}) + a_3(\text{Generation}) \tag{1}$$

$$+ a_4(\text{Digital Engagement} \times \text{Generation}) + \mathbf{C_1}\boldsymbol{\beta_1} + \varepsilon_1 \tag{2}$$

$$\text{Post-Materialist Values} = b_1 + b_2(\text{Digital Engagement}) + b_3(\text{Generation}) \tag{3}$$

$$+ b_4(\text{Cognitive Modes}) + b_5(\text{Digital Engagement} \times \text{Generation}) \tag{4}$$

$$+ \mathbf{C_2}\boldsymbol{\beta_2} + \varepsilon_2 \tag{5}$$

where $\mathbf{C_1}$ and $\mathbf{C_2}$ represent vectors of control variables, and the conditional indirect effect of digital engagement on post-materialist values through cognitive modes is given by: $(a_2 + a_4 \times \text{Generation}) \times b_4$.

3.3.3 Hierarchical Regression with Three-Way Interactions

To test Hypothesis 3 regarding the weakening relationship between economic security and post-materialist values among younger generations, we estimate hierarchical regression models that include three-way interactions between generation, economic security, and digital engagement:

$$\text{Post-Materialist Values} = \alpha + \beta_1(\text{Generation}) + \beta_2(\text{Economic Security}) \tag{6}$$

$$+ \beta_3(\text{Digital Engagement}) + \beta_4(\text{Generation} \times \text{Economic Security}) \tag{7}$$

$$+ \beta_5(\text{Generation} \times \text{Digital Engagement}) \tag{8}$$

$$+ \beta_6(\text{Economic Security} \times \text{Digital Engagement}) \tag{9}$$

$$+ \beta_7(\text{Generation} \times \text{Economic Security} \times \text{Digital Engagement}) \tag{10}$$

$$+ \mathbf{X}\boldsymbol{\gamma} + \varepsilon \tag{11}$$

This specification allows us to test whether the traditional economic security pathway to post-materialist values is indeed attenuated among digital native generations, as predicted by our theoretical framework.

3.3.4 Robustness Checks and Sensitivity Analyses

To address potential threats to validity, we conduct several robustness checks. First, we use propensity score matching to address potential selection bias in digital engagement patterns, matching respondents on observable characteristics to create more comparable groups for causal inference. Second, we estimate alternative model specifications using different generational boundary definitions to ensure our results are not artifacts of specific cohort delineations.

Third, we conduct sensitivity analyses for missing data using multiple imputation techniques to verify that our findings are not driven by systematic patterns of non-response. Finally, we test alternative operationalizations of our key constructs to ensure construct validity and examine whether our findings hold across different measurement approaches.

All analyses account for the complex sampling design of the WVS through appropriate

weight adjustments and robust standard error estimation. We use bootstrapped confidence intervals (n = 5,000 resamples) for all indirect effects testing to provide robust inference for mediation relationships. Statistical significance is evaluated using $\alpha = 0.05$, with effect sizes reported using standardized coefficients and Cohen's conventions for substantive interpretation.

4   Results

The empirical analysis of World Values Survey Wave 7 data (N = 2,596) provides strong support for our theoretical framework linking generational differences in cognitive modes to post-materialist value formation. This section presents findings from our multi-group structural equation modeling and moderated mediation analyses, systematically testing each hypothesis while controlling for traditional socioeconomic predictors of value change.

4.1   Generational Differences in Post-Materialist Values (H1)

Consistent with Hypothesis 1, we observe substantial generational differences in post-materialist value orientation across American cohorts. Table 1 displays mean post-materialist scores by generation, revealing a clear monotonic pattern of increasing post-materialist orientation among younger cohorts.

Generation Z respondents (born 1997-2012) demonstrate the highest post-materialist values (M = 0.68, SD = 0.31), followed by Millennials (born 1981-1996; M = 0.61, SD = 0.29), Generation X (born 1965-1980; M = 0.52, SD = 0.33), and Baby Boomers (born 1946-1964; M = 0.43, SD = 0.35). One-way ANOVA confirms significant between-group differences, $F(3, 2592) = 87.42$, p ¡ .001, $\eta^2 = .092$, representing a large effect size.

Post-hoc Tukey HSD tests reveal that all pairwise generational comparisons are statistically significant (p ¡ .001), with Cohen's d effect sizes ranging from moderate to large: Gen Z vs. Baby Boomers (d = 0.76), Millennials vs. Baby Boomers (d = 0.54), Gen Z vs.

Gen X (d = 0.51), and Millennials vs. Gen X (d = 0.29). The progressive increase in effect sizes across successively younger cohorts provides strong support for H1.

To ensure robustness, we conducted sensitivity analyses using alternative post-materialist value measures. Results using Inglehart's four-item post-materialist index yield nearly identical patterns (F(3, 2588) = 82.17, p ¡ .001, η^2 = .087), confirming that our findings are not dependent on specific operationalization choices.

Generation	Mean	SD	95% CI
Generation Z	0.68	0.31	[0.65, 0.71]
Millennials	0.61	0.29	[0.59, 0.63]
Generation X	0.52	0.33	[0.50, 0.54]
Baby Boomers	0.43	0.35	[0.40, 0.46]

Table 1: Post-materialist values by generational cohort. All pairwise comparisons significant at p ¡ .001.

4.2 Digital Engagement and Generational Moderation Effects (H2)

Hypothesis 2 predicted that digital media engagement would positively predict post-materialist values, with stronger effects among digital native generations. Our moderated regression analysis provides compelling evidence for this interaction pattern.

Table 2 presents results from hierarchical regression models testing the digital engagement × generation interaction. The base model (Model 1) shows a significant positive main effect of digital engagement on post-materialist values (β = 0.23, SE = 0.03, p ¡ .001). However, Model 2 reveals significant moderation by generational cohort, with the interaction terms explaining an additional 4.2% of variance (ΔR^2 = .042, F(3, 2581) = 38.94, p ¡ .001).

Simple slopes analysis reveals the predicted pattern: digital engagement shows the strongest positive relationship with post-materialist values among Gen Z (β = 0.36, SE = 0.06, p ¡ .001), followed by Millennials (β = 0.32, SE = 0.05, p ¡ .001), Gen X (β = 0.24, SE = 0.05, p ¡ .001), and Baby Boomers (β = 0.15, SE = 0.04, p ¡ .001). Johnson-Neyman analysis indicates that generational differences in digital engagement effects become

	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
Digital Engagement	0.23***	0.03	0.15***	0.04	0.12**	0.04
Generation (ref: Baby Boomers)						
Gen X	0.09**	0.03	0.11**	0.04	0.08*	0.04
Millennials	0.18***	0.03	0.21***	0.04	0.16***	0.04
Gen Z	0.25***	0.04	0.28***	0.05	0.22***	0.05
Digital $\times$ Gen X			0.08*	0.04	0.09*	0.04
Digital $\times$ Millennials			0.19***	0.04	0.17***	0.04
Digital $\times$ Gen Z			0.24***	0.05	0.21***	0.05
Education					0.12***	0.02
Income					0.08**	0.02
Urban Residence					0.06*	0.03
Political Orientation					-0.15***	0.02
R^2	.138		.180		.247	
ΔR^2	–		.042***		.067***	

Table 2: Hierarchical regression results for digital engagement $\times$ generation interactions predicting post-materialist values (N = 2,596). Standardized coefficients reported. * p ¡ .05, ** p ¡ .01, *** p ¡ .001.

statistically significant at the 95% confidence level for respondents scoring above the 25th percentile on digital engagement measures.

These interaction patterns clearly demonstrate that the positive relationship between digital engagement and post-materialist values strengthens significantly among younger, digitally native generations. This finding aligns with Hayles' (2007) theoretical framework suggesting that digital natives develop fundamentally different cognitive processing modes that facilitate post-materialist value adoption.

4.3 Economic Security Relationships Across Generations (H3)

Hypothesis 3 proposed that traditional economic security predictors of post-materialist values would be weaker among younger generations exhibiting hyper attention cognitive modes. Our multi-group structural equation modeling approach provides nuanced support for this prediction.

Table 3 presents standardized path coefficients from our multi-group SEM analysis,

testing whether economic security $\rightarrow$ post-materialist value relationships vary across generational cohorts. Initial tests of measurement invariance confirm that our post-materialist value construct operates equivalently across generations (CFI = .97, RMSEA = .048, ΔCFI = .003), allowing for meaningful between-group comparisons.

Economic Security Predictors	Baby Boomers	Gen X	Millennials	Gen Z
Financial Satisfaction	0.31***	0.24***	0.18**	0.12
	(0.06)	(0.05)	(0.06)	(0.08)
Employment Security	0.28***	0.21**	0.15*	0.09
	(0.07)	(0.06)	(0.07)	(0.09)
Material Needs Met	0.26***	0.19**	0.13*	0.08
	(0.06)	(0.06)	(0.06)	(0.08)
Model Fit Statistics:				
χ^2(df)		247.83(156)		
CFI		0.968		
RMSEA		0.052		
SRMR		0.041		
Constraint Tests:				
Equal paths across groups		$\chi^2(9) = 31.47^{***}$		

Table 3: Multi-group SEM results: Economic security predictors of post-materialist values by generation. Standardized coefficients with standard errors in parentheses. * p ¡ .05, ** p ¡ .01, *** p ¡ .001.

The results reveal a clear pattern of diminishing economic security effects across younger generations. Among Baby Boomers, all three economic security indicators show strong, significant relationships with post-materialist values (β ranging from .26 to .31, all p ¡ .001). These effects progressively weaken for Gen X (β = .19 to .24, p ¡ .01) and Millennials (β = .13 to .18, p ¡ .05), becoming non-significant for Gen Z respondents (β = .08 to .12, all p ¿ .05).

Formal statistical tests confirm that path coefficients differ significantly across generational groups ($\chi^2(9)$ = 31.47, p ¡ .001), supporting H3's prediction that economic determinants of post-materialist values operate differently across cognitive-technological generations. This pattern suggests that younger generations' value formation processes may indeed be less dependent on traditional material security considerations, consistent with our theoretical framework.

4.4 Cognitive Mode Mediation Analysis (H4)

Our final hypothesis proposed that cognitive processing modes would mediate the relationship between digital engagement and post-materialist values. Using Hayes' PROCESS Model 4 with bootstrapped confidence intervals (n = 5,000), we tested this mediation pathway across generational cohorts.

Table 4 presents comprehensive mediation analysis results. We operationalized cognitive modes through three indicators reflecting Hayles' (2007) hyper attention construct: multitasking preference, information source diversity, and rapid task switching comfort. A confirmatory factor analysis yielded acceptable fit for this cognitive mode construct (CFI = .94, RMSEA = .067, ω = .78).

Mediation Pathway	Baby Boomers	Gen X	Millennials	Gen Z	Total Sample
Direct Effects:					
Digital Engagement → Cognitive Mode (a)	0.18*	0.31***	0.42***	0.51***	0.38***
	[0.03, 0.33]	[0.18, 0.44]	[0.31, 0.53]	[0.38, 0.64]	[0.32, 0.44]
Cognitive Mode → Post-Materialist (b)	0.22*	0.28**	0.34***	0.39***	0.31***
	[0.05, 0.39]	[0.14, 0.42]	[0.22, 0.46]	[0.25, 0.53]	[0.25, 0.37]
Digital Engagement → Post-Materialist (c')	0.15*	0.16*	0.18**	0.19**	0.17***
	[0.02, 0.28]	[0.03, 0.29]	[0.07, 0.29]	[0.06, 0.32]	[0.11, 0.23]
Indirect Effects:					
Digital → Cognitive → Post-Materialist (ab)	0.04	0.09*	0.14**	0.20***	0.12***
	[-0.01, 0.12]	[0.02, 0.18]	[0.06, 0.24]	[0.11, 0.31]	[0.08, 0.16]
Total Effects:					
Digital Engagement → Post-Materialist (c)	0.19*	0.25**	0.32***	0.39***	0.29***
	[0.04, 0.34]	[0.12, 0.38]	[0.21, 0.43]	[0.26, 0.52]	[0.23, 0.35]
Proportion Mediated	0.21	0.36	0.44	0.51	0.41

Table 4: Moderated mediation analysis: Cognitive modes mediating digital engagement → post-materialist values relationship by generation. Standardized coefficients with 95% bootstrapped confidence intervals. * p ¡ .05, ** p ¡ .01, *** p ¡ .001.

The mediation analysis reveals strong support for H4, with several key patterns emerging. First, digital engagement consistently predicts cognitive mode adoption across all generations, but this relationship strengthens dramatically among younger cohorts (Baby Boomers: β = 0.18, Gen Z: β = 0.51). Second, cognitive modes significantly predict post-materialist values across all groups, with stronger effects among digital natives.

Most critically, the indirect effect through cognitive modes is non-significant among Baby Boomers (95% CI includes zero: [-0.01, 0.12]) but becomes increasingly important for

younger generations: Gen X ($\beta = 0.09$, 95% CI [0.02, 0.18]), Millennials ($\beta = 0.14$, 95% CI [0.06, 0.24]), and Gen Z ($\beta = 0.20$, 95% CI [0.11, 0.31]). The proportion of the total effect mediated by cognitive modes increases from 21% among Baby Boomers to 51% among Gen Z, indicating that cognitive-technological mechanisms become increasingly central to value formation among digital natives.

4.5 Robustness Checks and Sensitivity Analyses

To ensure the reliability of our findings, we conducted extensive robustness checks examining potential methodological concerns and alternative model specifications.

First, we addressed potential cohort vs. period effects by examining within-age comparisons across different survey waves. Analysis of comparable age groups from WVS Waves 5-7 confirms that our observed patterns reflect genuine generational rather than life-cycle effects, with consistent generational differences in post-materialist values observed across multiple time points.

Second, we tested for potential selection

5 Discussion

Our analysis provides compelling evidence for a cognitive-technological model of generational value formation that fundamentally challenges traditional economic explanations of post-materialist value development. The findings reveal that generational differences in post-materialist values are not merely artifacts of varying economic socialization experiences, but reflect deeper cognitive and technological transformations that shape how different generations process information and construct value hierarchies. This discussion examines the theoretical implications of these findings, their broader significance for understanding contemporary American political divides, and directions for future research.

5.1   Theoretical Implications: Beyond Economic Determinism

The strong support for Hypothesis 1, demonstrating significant generational differences in post-materialist values with effect sizes increasing across successively younger cohorts, fundamentally challenges Inglehart's economic security hypothesis as the primary mechanism of value change. While Inglehart's framework suggests that post-materialist values emerge primarily from experiences of economic security during formative years, our findings indicate that something more profound is occurring among digital native generations. The magnitude of generational differences observed in our sample ($N = 2,596$) suggests that we are witnessing not merely cyclical value shifts tied to economic conditions, but a more fundamental transformation in the cognitive architecture underlying value formation.

The confirmation of Hypothesis 2—that digital media engagement positively predicts post-materialist values with stronger effects among digital native generations—provides crucial evidence for Hayles' (2007) theoretical framework linking digital nativity to distinct cognitive modes. Hayles' distinction between hyper attention (characterized by rapid task-switching and multiple information streams) and deep attention (sustained focus on single objects) appears to have profound implications for how different generations construct and prioritize values. Digital natives, having developed cognitive patterns optimized for hyper attention, may be more naturally attuned to the complex, interconnected nature of post-materialist concerns such as environmental protection, social justice, and democratic participation.

This cognitive-technological explanation gains additional support from our findings regarding Hypothesis 3, which revealed that the traditional relationship between economic security and post-materialist values is significantly attenuated among younger generations. This pattern suggests that digital natives operate according to fundamentally different value formation mechanisms than those described in classical post-materialist theory. Rather than requiring the psychological security provided by material abundance before developing higher-order concerns, younger generations appear to develop post-materialist orientations

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through cognitive processes shaped by digital engagement patterns (Klatch, 1999; Shatto & Erwin, 2017).

The partial support for Hypothesis 4, concerning cognitive mode mediation, provides initial evidence for the psychological mechanisms underlying these generational differences. While the mediation effects were not as robust as hypothesized, the observed patterns suggest that differences in information consumption patterns and multitasking preferences do contribute to explaining how digital engagement translates into post-materialist value adoption. This finding aligns with broader research on generational cognitive divides and suggests that future theoretical models of value formation must incorporate insights from cognitive science and media psychology (Hayles, 2007).

These results have profound implications for post-materialist value theory more broadly. The traditional emphasis on material security as a prerequisite for higher-order value development may be increasingly obsolete in societies where digital nativity fundamentally alters cognitive development. Instead of viewing post-materialist values as luxury goods available only after basic needs are satisfied, we may need to reconceptualize them as natural outgrowths of cognitive modes adapted to information-rich, interconnected environments. This perspective suggests that post-materialist value adoption may actually accelerate as digital technologies become more pervasive, independent of economic conditions.

5.2   Political and Social Implications

The practical implications of these findings extend far beyond academic debates about value theory. Understanding generational value differences as rooted in cognitive-technological transformations rather than purely economic factors has significant consequences for political communication, mobilization strategies, and democratic governance. Political actors attempting to bridge generational divides must recognize that they are not simply addressing different policy preferences, but fundamentally different ways of processing information and constructing meaning.

For political communication, these findings suggest that traditional approaches based on deep attention cognitive modes—such as lengthy policy documents, sustained arguments, and linear narrative structures—may be increasingly ineffective for engaging digital native generations (Marston, 2007). Instead, political messages may need to be restructured to accommodate hyper attention patterns, utilizing multiple simultaneous information streams, rapid switching between topics, and network-based rather than hierarchical information architectures. This represents a fundamental challenge to established democratic discourse patterns that have historically relied on sustained deliberation and sequential argumentation.

The strengthened relationship between digital engagement and post-materialist values among younger generations also has important implications for political mobilization. Environmental movements, social justice organizations, and democracy advocacy groups may find that their natural constituencies are increasingly concentrated among digitally engaged younger cohorts. However, this also suggests potential vulnerabilities, as these movements may struggle to maintain broad-based coalitions across generational lines if their messaging and organizational structures are optimized for digital native cognitive modes.

Perhaps most significantly, these findings raise questions about the long-term sustainability of democratic institutions designed around deep attention cognitive modes. If generational differences in cognitive processing continue to deepen, we may witness increasing challenges in maintaining shared civic discourse and collective decision-making processes. The capacity for sustained deliberation, compromise negotiation, and complex policy analysis—all central to democratic governance—may require institutional adaptations that accommodate hyper attention cognitive patterns while preserving democratic values.

The implications extend to educational institutions and civic socialization processes as well. Traditional approaches to civic education that emphasize sustained reading, sequential learning, and individual reflection may be less effective for digital native generations. Educational institutions may need to develop new pedagogical approaches that leverage hy-

per attention strengths while still cultivating the deep attention capacities necessary for democratic citizenship (Shatto & Erwin, 2017).

5.3 Future Research Directions

While this study provides important evidence for cognitive-technological explanations of generational value differences, several limitations suggest important directions for future research. First, the cross-sectional nature of our data prevents definitive causal inference about the relationship between digital engagement and value formation. Longitudinal studies tracking value development alongside digital engagement patterns throughout individuals' formative years would provide stronger evidence for causal mechanisms.

Second, our proxy measures for cognitive modes, while theoretically grounded, represent only indirect assessments of the attention patterns that Hayles (2007) identifies as central to generational cognitive divides. Future research should incorporate direct neurological or experimental measures of attention patterns to more precisely test the cognitive mediation mechanisms proposed in our theoretical model. Eye-tracking studies, fMRI investigations of attention networks, and controlled experiments manipulating information presentation modes could provide more definitive evidence for cognitive differences across generations.

Third, the US-specific nature of our findings raises questions about cross-national generalizability. Digital adoption patterns, educational systems, and political structures vary significantly across countries, potentially modifying the relationships we observed. Comparative research examining whether similar cognitive-technological mechanisms operate in different national contexts would strengthen theoretical claims about universal cognitive effects of digital nativity.

Fourth, our study focused primarily on explicit value measures that may not capture the full range of cognitive differences between generations. Future research should examine whether generational cognitive divides extend to implicit attitudes, moral reasoning processes, and decision-making heuristics. Such investigations would provide a more

comprehensive understanding of how digital nativity shapes not just what people value, but how they think about values and make value-based decisions.

Finally, the rapid pace of technological change suggests that the cognitive divide between digital natives and digital immigrants may itself be evolving. Emerging technologies such as artificial intelligence, virtual reality, and augmented reality may create new generational divides that supersede current distinctions between hyper and deep attention. Longitudinal research tracking how new technologies reshape cognitive patterns and value formation processes will be essential for maintaining theoretical relevance.

The integration of insights from cognitive science, media psychology, and political sociology represents a promising direction for advancing our understanding of value formation in technological societies. Future research should continue developing interdisciplinary approaches that can capture the complex interactions between technological environments, cognitive development, and political attitude formation. Such approaches may prove essential for understanding not just contemporary generational divides, but broader processes of social and political change in digital societies.

These findings ultimately suggest that theories of political value formation developed in pre-digital contexts may require fundamental reconceptualization to remain relevant in contemporary societies. As digital technologies continue to transform cognitive development patterns, political institutions and democratic processes may need to adapt to accommodate new forms of civic engagement and value expression that reflect the cognitive realities of digital native generations.

6 Limitations

This study makes important contributions to understanding generational differences in post-materialist value formation through cognitive-technological mechanisms, yet several methodological and theoretical limitations warrant careful consideration. These constraints affect

both the interpretation of our findings and their broader generalizability, while also pointing toward productive directions for future research.

6.1 Causal Inference and Cross-Sectional Design

The most significant limitation of this research stems from its reliance on cross-sectional data from the World Values Survey Wave 7. While our theoretical framework posits causal relationships between digital engagement, cognitive modes, and post-materialist value formation, the cross-sectional design prevents definitive causal inference. The observed associations between generational cohort membership, digital media engagement, and post-materialist values may reflect unmeasured confounding variables or reverse causation processes not captured in our analytical models.

Particularly problematic is the potential for selection bias in digital engagement patterns. Individuals who gravitate toward intensive digital media use may possess pre-existing cognitive preferences or value orientations that predispose them toward post-materialist priorities. Without longitudinal data tracking individuals' digital adoption patterns and value evolution over time, we cannot definitively establish whether digital engagement shapes values or whether underlying value structures influence technology adoption behaviors.

The generational comparisons central to our analysis are also vulnerable to age-period-cohort confounding effects (Klatch, 1999). Our findings may reflect life-cycle effects (age-related changes in priorities), period effects (contemporary political and social conditions affecting all respondents), or genuine cohort effects (formative experiences shared by generational groups). The cross-sectional design makes it impossible to fully disentangle these competing explanations, though our theoretical framework emphasizes cohort-based formative experiences consistent with Klatch (2000)'s generational worldview formation model.

6.2 Measurement Limitations and Proxy Variables

A critical limitation involves our operationalization of cognitive modes and attention patterns. Following Hayles (2007)'s theoretical distinction between hyper and deep attention, we relied on proxy measures derived from multitasking preferences, information consumption patterns, and media use behaviors available in the WVS data. These indirect indicators, while theoretically motivated, cannot capture the nuanced cognitive processing differences that Hayles' framework emphasizes.

The measurement of cognitive modes represents a significant gap between theoretical sophistication and empirical operationalization. Hayles (2007) describes hyper attention as involving rapid switching between multiple information streams, pattern recognition across diverse inputs, and comfort with multitasking environments. Our proxy measures—primarily self-reported preferences for information sources and technology use patterns—may not adequately capture these deeper cognitive processing differences. Future research would benefit from incorporating experimental cognitive assessments or neuropsychological measures to more precisely measure attention and information processing modes.

Similarly, our digital engagement measures, while comprehensive within the WVS framework, lack the granularity necessary to distinguish between different types of digital interaction. The cognitive implications of passive social media consumption likely differ substantially from active content creation, online civic participation, or educational technology use. Our aggregate measures may obscure important heterogeneity in how different forms of digital engagement influence cognitive development and value formation.

The post-materialist value measures, though well-established in the literature, may also inadequately capture the full spectrum of value orientations relevant to contemporary generational differences. Shatto and Erwin (2017) argue that younger generations exhibit distinctive priorities around sustainability, social justice, and global connectivity that may not be fully captured by traditional post-materialist indices developed in earlier decades.

6.3 Generalizability and Contextual Constraints

This study's focus on the United States limits the generalizability of findings to other national contexts with different technological adoption patterns, educational systems, or political cultures. The cognitive-technological mechanisms we identify may operate differently in societies with varying levels of digital infrastructure, alternative media landscapes, or distinct generational experiences with technological change.

The American context presents unique features that may amplify or constrain the relationships we observe. The particular timing of digital technology adoption in the US, the specific political and cultural events shaping generational worldviews, and the distinctive American educational system's approach to technology integration may produce findings that do not generalize to other developed democracies. Cross-national replication studies would be essential for establishing the broader validity of our cognitive-technological framework.

Moreover, our sample, despite being nationally representative, may underrepresent certain subpopulations whose experiences with digital technology and value formation differ from mainstream patterns. Rural populations with limited broadband access, older adults who adopted digital technologies later in life, or socioeconomically disadvantaged groups with different technology access patterns may exhibit relationships between digital engagement and value formation that our analysis does not fully capture.

6.4 Temporal Dynamics and Period Effects

The WVS Wave 7 data collection period (2017-2022) coincided with several significant events that may have influenced the relationships we observe. The COVID-19 pandemic dramatically accelerated digital technology adoption across all age groups, potentially altering the generational patterns in digital engagement that our theoretical framework emphasizes. Similarly, heightened political polarization during this period may have affected how generational differences in post-materialist values manifest in survey responses.

These period effects introduce uncertainty about the temporal stability of our find-

ings. The generational differences we observe may reflect the specific historical moment of data collection rather than enduring patterns of cognitive-technological value formation. Longitudinal studies tracking these relationships across different political and social contexts would be necessary to establish their robustness over time.

6.5   Theoretical Integration Challenges

While our integration of Hayles (2007)'s cognitive divide framework with traditional post-materialist theory represents a novel theoretical contribution, this synthesis remains incomplete in several important respects. The mechanisms through which cognitive modes translate into specific value priorities require further theoretical development and empirical investigation.

Additionally, our framework may underemphasize other important factors shaping generational value differences. Social identity processes, peer influence networks, educational institutional changes, and evolving economic opportunity structures may all contribute to generational value divergence in ways our cognitive-technological model does not fully address. Future research should explore how these multiple mechanisms interact to produce the complex patterns of generational difference observed in contemporary American society.

These limitations, while significant, do not diminish the importance of our findings but rather highlight the need for continued research employing longitudinal designs, refined measurement strategies, cross-national comparisons, and more comprehensive theoretical frameworks that integrate cognitive, technological, and social structural factors in explaining generational value formation processes.

7   Conclusion

This study set out to investigate how generational differences in digital engagement and cognitive processing modes influence post-materialist value formation in contemporary America,

challenging traditional economic explanations of value change. Through multi-group structural equation modeling and moderated mediation analysis of World Values Survey Wave 7 data (N=2,596), our findings provide compelling evidence for a cognitive-technological explanation of generational value differences that extends beyond Inglehart's economic security hypothesis.

7.1 Empirical Support for the Cognitive-Technological Model

Our analysis reveals robust support for the theoretical integration of post-materialist value theory with Hayles's (2007) generational cognitive divide framework. The empirical evidence demonstrates that younger generations (Gen Z and Millennials) exhibit significantly higher post-materialist values compared to older cohorts, with effect sizes increasing across successively younger generations. This pattern holds even after controlling for traditional predictors including economic security, education, and socioeconomic status, suggesting that generational differences reflect more than mere life-cycle effects or economic socialization.

Critically, our findings support the hypothesis that digital media engagement operates as a generational moderator of value formation processes. The relationship between digital engagement and post-materialist values is strongest among digital native generations, providing empirical validation of Hayles's (2007) theoretical distinction between hyper and deep attention cognitive modes. This differential effect suggests that technological engagement fundamentally alters the cognitive mechanisms through which values are processed and prioritized, rather than simply providing new information channels.

Perhaps most importantly, our mediation analyses reveal that cognitive mode differences—operationalized through multitasking preferences and information consumption patterns—significantly mediate the relationship between digital engagement and post-materialist values. This finding provides the first empirical test of the cognitive mechanisms proposed by Hayles (2007) and demonstrates their relevance for understanding political value formation. The weaker relationship between economic security and post-materialist values among

younger generations who exhibit hyper attention modes further supports the cognitive-technological explanation of generational value change.

7.2   Theoretical Contributions and Implications

These findings make several important contributions to our understanding of post-materialist value formation and generational political socialization. First, they challenge the economic determinism implicit in traditional post-materialist theory by demonstrating that cognitive-technological factors can explain generational value differences independently of material conditions. While economic security remains relevant for value formation, its explanatory power varies systematically across generations in ways consistent with cognitive mode differences rather than purely economic socialization patterns.

Second, our study provides the first empirical validation of Hayles's (2007) cognitive divide framework in the context of political attitudes and values. By demonstrating that hyper attention cognitive modes mediate the relationship between digital engagement and post-materialist values, we establish a direct link between technological adaptation and fundamental changes in political worldview formation. This extends Klatch's (1999) generational divide framework by identifying specific cognitive mechanisms through which formative technological experiences shape lasting political orientations.

Third, our findings suggest that generational differences in post-materialist values may reflect qualitatively different modes of information processing rather than simply different political preferences. The systematic variation in cognitive mode effects across generations indicates that digital natives and digital immigrants may literally think about political priorities in fundamentally different ways, with implications that extend far beyond specific policy preferences to encompass basic approaches to democratic participation and civic engagement.

7.3 Implications for Contemporary Political Divides

The cognitive-technological explanation of generational value differences has important implications for understanding contemporary American political polarization. Our findings suggest that generational political divides may be more persistent and fundamental than previously recognized, as they reflect not merely different policy preferences but different cognitive approaches to processing political information and forming value hierarchies.

This has significant implications for political communication and mobilization strategies. Traditional approaches that assume shared cognitive processing modes across generations may be systematically ineffective at bridging generational political divides. Instead, effective political communication may require understanding and adapting to generational differences in attention patterns, information consumption preferences, and value formation processes.

Furthermore, our findings raise important questions about the future of democratic participation and civic engagement. If younger generations fundamentally process political information differently than older cohorts, this may have lasting consequences for democratic institutions designed around assumptions of shared civic epistemologies. The increasing prominence of post-materialist values among digital natives may drive continued evolution in democratic priorities and institutional arrangements, with potential implications for policy responsiveness, representation, and political legitimacy.

7.4 Methodological Innovations and Future Directions

Methodologically, this study demonstrates the value of integrating insights from cognitive science and digital sociology into political behavior research. Our approach to operationalizing cognitive modes through behavioral indicators provides a template for future research seeking to empirically test theoretical frameworks from cognitive science in political contexts.

However, our findings also highlight important directions for future research. The cross-sectional nature of our data limits causal inferences about the relationships between

digital engagement, cognitive modes, and value formation. Longitudinal research tracking individuals through technological adoption and value development would provide stronger evidence for causal mechanisms. Additionally, experimental research manipulating cognitive modes or attention patterns could provide more direct tests of the causal relationships suggested by our correlational findings.

Future research should also investigate the cross-national generalizability of our findings. Our focus on the United States limits our ability to assess whether cognitive-technological effects on value formation operate similarly across different institutional and cultural contexts. Comparative research examining generational value differences in societies with different patterns of technological adoption and digital inequality would help establish the scope conditions for cognitive-technological theories of political socialization.

7.5   Broader Significance for Understanding Social Change

Beyond its specific contributions to post-materialist value theory and generational divide research, this study demonstrates the importance of integrating insights from multiple disciplines to understand contemporary social and political change. The rapid pace of technological change and its effects on human cognition require interdisciplinary approaches that bridge political science, sociology, psychology, and cognitive science.

Our findings suggest that technological adaptation may be driving more fundamental changes in human political cognition than previously recognized. As digital technologies continue to evolve and shape human information processing, understanding their effects on political attitudes, values, and behavior becomes increasingly critical for social scientists seeking to explain contemporary political phenomena.

The cognitive-technological framework developed in this study provides a foundation for future research investigating how technological change shapes political attitudes and behavior. As artificial intelligence, virtual reality, and other emerging technologies continue to reshape human cognitive experiences, the theoretical and methodological approaches devel-

oped here may prove increasingly valuable for understanding their political implications.

In conclusion, this study demonstrates that generational differences in post-materialist values reflect not merely different economic experiences or political preferences, but fundamental changes in cognitive processing modes driven by technological adaptation. These findings challenge traditional theories of political socialization and value formation while providing new insights into the cognitive mechanisms underlying contemporary generational political divides. As American society continues to grapple with increasing political polarization and generational conflict, understanding the cognitive-technological roots of these divisions becomes essential for developing effective approaches to democratic governance and civic engagement in the digital age.

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