

## Synthetica: The First AI-Native Cohort and the Democratic Risks of Synthetic Infrastructures

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### ABSTRACT

This article advances the concept of *Synthetica*, the first AI-native cohort, building on earlier work that maps generational identity to technological epochs rather than arbitrary birth years. Born roughly between 2021 and the next technological revolution, *Synthetica* will grow up in environments mediated not by static media or algorithmic feeds but by adaptive artificial intelligence companions, immersive mixed realities, and ubiquitous autonomous systems.

The central claim is political: just as broadcast television shaped Baby Boomers and algorithmic feeds shaped Millennials and Gen Z, the political life of *Synthetica* will be conditioned by a dual vulnerability. First, capture—synthetic infrastructures programmed by corporate and state actors who shape the boundaries of “reasonable” thought. Second, misuse—weaponization of AI for fraud, deep fakes, and disinformation that collapses the evidentiary ground of truth itself.

This article also situates *Synthetica* within the trajectory of media and politics, reviews evidence on how mediated environments shape cognition and political behavior, and outlines a research agenda for examining the democratic risks of an AI-constituted generation. The analysis does not claim inevitability; it identifies structural warning signs and emphasizes that outcomes remain open to regulation, civic innovation, and public oversight.

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### Preface

This paper addresses a recurring problem in generational studies: the arbitrary segmentation of human cohorts by fixed calendar years without reference to the profound shifts in the cognitive and environmental landscape that shape development. Popular generational labels—Silent Generation, Baby Boomers, Gen X, Millennials, Gen Z, and Gen Alpha—are often demarcated by demographic events, historical moments, or sociological surveys. But these classifications fail to account for the most powerful force shaping cognition, communication, and identity in the modern era: technology.

More specifically, this paper contends that distinct technological epochs, marked by dominant modes of information and communication—radio, television, personal computing, mobile internet, and artificial intelligence—offer a more coherent framework for understanding generational shifts in behavior, cognition, and social norms. This approach is grounded in prior work by the author mapping generational identity to dominant technological interfaces, with particular attention to changes in media engagement, cognitive load, and socio-political participation.

By realigning generational boundaries around major inflection points in technological history, the model offers a more explanatory framework for observable cohort differences—especially in domains such as attention span, digital literacy, social behavior, and political agency. This shift in framing is not merely semantic; it reflects a deeper truth: that the tools through which individuals interact with the world fundamentally shape who they become.

This paper proceeds by outlining the theoretical basis for this reconceptualization, proposing a revised generational schema aligned with technological epochs, and exploring its implications through case studies in digital media, cognitive development, and political behavior. Particular attention is given to the emerging Generation *Synthetica*, the first cohort to be fully immersed in AI-mediated environments from birth — an epochal transition with consequences yet to be fully understood.

### 1. Introduction

A new generation is emerging—one that will never know a world without artificial intelligence. Children born today are entering environments shaped by generative AI, algorithmic recommendation engines, synthetic media, and voice-based assistants that anticipate their needs before they can articulate them. Their earliest toys will speak back, their classrooms will adapt in real time, and their social relationships will be filtered through predictive models and smart mediation systems. These children represent the first truly AI-native cohort: Generation *Synthetica*.

This paper builds on earlier work that proposes technological epochs as a more grounded and explanatory model for cohort identity than arbitrary birth-year cutoffs. In that model, the progression from the Broadcast Era to the Algorithmic Era was marked by distinct shifts in dominant media and associated cognitive patterns. However, we now appear to be crossing a sharper threshold—one that reflects a rupture, not a transition. The emergence of generative AI marks a shift into a synthetic co-evolutionary future, where cognition and agency are increasingly distributed between human and non-human intelligences.

The defining challenge for Generation Synthetica is not technological exposure alone, but a structural dual vulnerability that shapes both truth and power.

**First vulnerability: Capture.** Adaptive AI systems, when controlled by corporate oligarchs and state actors, risk narrowing the range of “reasonable” thought. These systems do not merely distribute information—they scaffold memory, guide decision-making, mediate identity formation, and shape civic reasoning from early childhood. Ownership of such platforms amounts to ownership of the developmental substrate itself. When billionaires and governments program the synthetic companions that mediate learning and socialization, they pre-structure democratic identity. The result is systems that are too certain—guiding users toward predetermined boundaries of acceptable belief.

**Second vulnerability: Misuse.** Even if capture were prevented, adversarial actors can weaponize the same technologies for fraud, deep fakes, voice cloning, and synthetic propaganda. As Sam Altman has warned, AI-enabled fraud already threatens financial systems and evidentiary norms [1]. For Generation Synthetica, this means growing up in an environment where authenticity itself is in question. Video evidence can be fabricated. Audio recordings can be cloned. Peer interactions may involve synthetic agents. The result is systems that make nothing certain—collapsing the shared epistemic ground on which trust and accountability depend.

**The paradox of Synthetica:** This generation will be raised by systems that appear supremely confident (adaptive AI companions offering guidance) while simultaneously living in a world where confidence cannot be trusted (deep fakes undermining evidence). They will navigate environments that are both over-determined (captured by oligarchs) and under-determined (destabilized by adversaries). Learning to survive this paradox may become the defining cognitive challenge of their generation.

## Purpose and Scope

The purpose of this report is threefold:

1. To define Generation Synthetica as a novel generational identity rooted not in digital exposure alone, but in immersive AI saturation from birth onward.
2. To forecast how this cohort may differ cognitively, socially, and politically from its predecessors—with particular attention to the dual vulnerability of capture and misuse.
3. To examine the implications of these changes for democratic institutions, governance models, and the future of human agency.

This report does not offer speculation—it frames a present reality. Children born into the AI-saturated world of the 2020s will not merely use intelligent systems. They will be shaped by them, growing up in environments where synthetic inputs, intelligent

feedback loops, and automated mediation are woven into the fabric of daily life. The defining feature of Generation Synthetica is not their access to technology, but their development in tandem with it.

Unlike previous generations who witnessed the arrival of digital tools, this group will never experience a pre-AI baseline. For them, AI is not an innovation—it is the operating system of life. Its presence is ambient, embedded, and assumed.

This cohort is not defined strictly by a fixed birth year, but by its formative technological context. Children born from approximately 2021 onward—the period when AI systems began permeating homes, classrooms, and workplaces—represent a historical inflection point. However, it was the subsequent proliferation of DALL·E, LaMDA, and Gemini between 2021 and 2023 that signaled a transition from novelty to saturation [2,3,4]. These developments extended generativity beyond text, enabling fluid image synthesis, conversational reasoning, and multimodal integration.

As Sam Altman, CEO of OpenAI, has publicly cautioned, children of the future will only know a world dominated by AI [5]. This is not speculation—it is an unfolding reality.

This article builds directly on the technology epoch framework to develop the concept of Synthetica with specific attention to its political dimensions. Section 2 situates the cohort in the longer trajectory of media and politics, from broadcast to algorithmic platforms. Section 3 defines the technological environment of Synthetica and clarifies the qualitative break from Gen Z. Sections 4 and 5 examine the cognitive, social, and political implications of AI-constituted environments, with emphasis on democratic resilience and oligarchic control. The conclusion outlines a research agenda for scholars and policymakers confronting the advent of the synthetic era.

This generation will form identities, expectations, and political instincts within a world where natural intelligence is only one among many cognitive actors. The implications extend far beyond metrics like screen time or media exposure. Generation Synthetica represents a new kind of subjectivity—one whose developmental terrain is mediated not by analog or digital tools, but by ubiquitous intelligence.

The political implications are profound. If earlier cohorts were shaped by what they saw, Synthetica will be shaped by who they become under the guidance of AI interlocutors. The critical question is not whether these technologies will exist—their development is already underway—but who defines their rules, values, and constraints, and whether citizens can trust what they see and hear.

Appendix A defines a Synthetic Saturation Index (SSI) and clarifies the conditions under which AI mediation would constitute a developmental environment rather than an assistive tool. The appendix is intended to define what would count as arrival of an AI-constituted cohort, not to assert that such conditions have already been met. A companion Appendix B, is a draft sample questionnaire for measuring the Synthetic Saturation Index.

The analysis that follows identifies structural risks arising from plausible trajectories of AI deployment; it does not claim inevitability, nor does it presume uniform outcomes across societies or institutions.

## 2. Media Epochs and Political Life

The history of modern politics can be read as a history of its dominant media systems. Each communication epoch has not only altered how information circulates, but has also restructured the conditions under which political identity is formed. A consistent pattern emerges: ownership of the dominant medium translates into disproportionate political power.

### 2.1 Broadcast Epoch (Radio and Television)

The first major transformation occurred with broadcast media. Radio and television created the first mass-mediated electorates, enabling direct appeals to citizens at a scale previously impossible. The 1960 Kennedy–Nixon debates demonstrated the new logic of visibility: while radio listeners judged Nixon the winner, television viewers favored Kennedy, whose composure and appearance conveyed authority on screen [6]. Political campaigns quickly adapted, relying on television advertising to shape voter perceptions. Electoral success became increasingly tied to commanding broadcast attention, with control over airtime becoming synonymous with political influence.

### 2.2 Cable and 24-Hour News Epoch

By the 1980s and 1990s, cable and satellite broadcasting extended this logic into continuous spectacle. CNN's coverage of the Gulf War in 1991 turned foreign policy into live television, producing what Kellner [7] called the "TV spectacle of the Gulf War". In this epoch, politics became less about persuasion across a broad electorate and more about audience capture within segmented viewerships. Ownership of cable platforms conferred the power to frame events for partisan publics.

### 2.3 Digital and Social Media Epoch

The early 2000s marked another inflection point. Howard Dean's 2004 primary campaign pioneered digital fundraising and volunteer recruitment, though Hindman [8] argues this did not fundamentally democratize politics. Barack Obama's 2008 campaign later built on these techniques to energize youth voters and amass unprecedented small-donor contributions. The Arab Spring in 2011 reinforced the narrative of digital platforms as democratizing tools [9]. Yet by 2016, social media's darker potential was manifest: Russian disinformation campaigns, Cambridge Analytica's psychographic targeting, and viral meme warfare shaped the political environment in which Donald Trump rose to power [10,11]. Social media transformed politics from broadcast persuasion to algorithmic manipulation—where visibility is engineered rather than earned.

### 2.4 Algorithmic and Influencer Epoch

By 2021, social media use revealed sharp generational divides. Among adults under 30, 71% used Instagram and 48% used TikTok, making these platforms central arenas for youth communication and identity [12]. Power migrated from institutions to influencers, who commanded audiences rivaling those of traditional media outlets.

One figure illustrates this transformation starkly: Laura Loomer. Despite holding no elected office, Loomer has converted her online presence into direct political leverage. Through viral campaigns, she claimed influence over multiple personnel dismissals deemed disloyal to Donald Trump, including National Security Council staffers [13,14]. Loomer's tactics—ranging from orchestrating outrage cycles to launching anonymous "tip lines" for identifying officials—demonstrate how algorithmically amplified visibility now confers real political authority. She is, in effect, an unelected power broker, enabled not by institutional mandate but by mastery of attention flows.

Loomer should be read as a flashing red light: a signal that the algorithmic epoch has shifted the locus of authority from institutional control of media to individual manipulation of platforms. In this configuration, politics becomes an attention economy, where the capacity to generate virality is indistinguishable from the capacity to wield influence.

### 2.5 The Synthetic Epoch (Emerging)

The trajectory is unmistakable. Broadcast media shaped what voters saw. Social media shaped what voters believed. Algorithmic platforms shaped who held power by weaponizing attention. The emerging Synthetic Epoch will extend this progression further: from shaping what voters consume to shaping who they become.

If an influencer like Loomer can, through algorithmic outrage, precipitate staffing changes in the National Security Council, the political leverage of synthetic AI companions—integrated into daily routines from early childhood—will be orders of magnitude greater. These companions will not merely present political messages; they will mediate identity formation itself. The Loomer phenomenon is therefore not a historical anomaly but a preview of what is to come: oligarchic control of synthetic environments shaping the civic identity of an entire cohort.

But this is only half the picture. Where Loomer weaponized attention, future adversaries will weaponize authenticity. Deep fakes, voice cloning, and synthetic propaganda will make it impossible to trust what one sees or hears. The synthetic epoch thus presents a double-edged threat: capture of cognitive development and collapse of evidentiary certainty.

## 3. Defining Synthetica

Having traced the trajectory of media epochs from broadcast to algorithmic platforms, it becomes clear that a new cohort is already forming—one whose civic and personal identity will be shaped by a qualitatively different technological environment.

### 3.1 Timeline and Boundaries

Following the model advanced in earlier work, we avoid rigid chronological labels and instead identify cohorts by their formative technological environments. On this basis, Generation Synthetica is likely to encompass those born roughly between 2021 and the next technical epoch—a period during which AI personal companions transitioned from experimental to mainstream adoption, with nearly three-quarters of teens using such technologies by 2025 [15], and market projections suggesting growth from \$30 million to \$70-150 billion by decade's end [16]. Concurrently, autonomous systems began limited commercial deployment in select applications, though widespread adoption remains gradual and sector-specific rather than ubiquitous [17]. These individuals will not remember a pre-AI childhood. Their earliest memories, learning processes, and social relationships will be entangled with adaptive synthetic systems. This approach aligns with the Pew Research Center [18] decision to move away from rigid generational labels, instead favoring cohort definitions rooted in structural forces rather than arbitrary birth years.

### 3.2 Defining Technologies

Three technological domains define the Synthetica environment:

AI Personal Agents — Unlike today's chatbots or voice assistants, these systems are projected to function as embedded companions: adaptive tutors, caregivers, and interlocutors integrated into everyday routines. Early studies on social chatbots

demonstrate their capacity to shape emotional engagement [19], raising important questions about responsible development and deployment of such systems [20]

**Mixed Reality (AR/VR)** — Immersive systems are expected to converge with daily life, blurring distinctions between physical and virtual domains. Research suggests that VR alters presence, empathy, and social interaction [21], while recent studies demonstrate that virtual reality, augmented reality, and mixed reality technologies are transforming educational paradigms through immersive and interactive environments [22].

**Autonomous Systems** — AI-driven logistics, transportation, and decision-making infrastructures are expanding into domains previously governed by human discretion. Scholars document how autonomous systems are transforming domains previously governed by human discretion [23], raising critical questions of trust, accountability, and control in safety-critical settings [24].

**Note on Brain-Computer Interfaces:** While BCIs feature prominently in speculative discussions of AI futures, their role in Synthetica's formative years is likely peripheral. Despite recent advances in clinical applications [25], BCIs face significant technical barriers including lengthy calibration requirements and high inter-subject variability [26], making widespread adoption for this cohort unlikely.

For this cohort, the cognitive environment will be defined by adaptive AI mirrors and immersive realities, not direct neural links. BCIs remain threshold technologies—closer to the mainframe stage than the smartphone—and merit separate treatment in future research. A useful analogy: the human brain processes information through five senses. A BCI would function as a potential sixth sense—a channel of information flowing directly into cognition, mediated by AI rather than biology. Whether that sense expands or constrains agency will depend on structures built before the channel opens.

### 3.3 Distinctive Features

What distinguishes Generation Synthetica from previous cohorts is not simply exposure to new technologies, but the constitutive nature of those technologies: they are adaptive, persistent, and developmentally formative. Whereas television broadcast the same image to millions, and social media curated content according to engagement algorithms, synthetic systems will respond to each individual in real time—shaping cognition, social behavior, and identity from the inside out.

The implications are political as much as cognitive. In the algorithmic epoch, figures like Laura Loomer demonstrated that attention manipulation alone can alter the staffing of national institutions. If outrage cycles on TikTok can remove senior officials, the next step is synthetic agents that mediate civic reasoning from childhood.

In this context, ownership of AI platforms no longer means control over content distribution—it means control over the developmental substrate of political identity. As Zuboff [27] argues, platform capitalism has shifted from data extraction to behavioral conditioning, while Napoli [28] demonstrates how algorithmic gatekeeping concentrates control over information distribution.

The synthetic epoch escalates this trend: from influencing what users do, to shaping who they are.

### 3.4 Why Synthetica Is Not Just “More Gen Z”

A critical objection must be addressed: Is Generation Synthetica merely an intensification of Gen Z, or does it represent a qualitative break?

Gen Z is already heavily mediated by algorithms. TikTok shapes their politics, Instagram curates their self-image, and GPT assists with homework. They live in filter bubbles, experience echo chambers, and navigate synthetic content daily. Why claim that Synthetica is fundamentally different?

The answer lies in three structural distinctions:

#### 1. Developmental Timing

Gen Z encountered social media and algorithmic feeds during adolescence or later—after foundational cognitive structures were already formed. Synthetica will encounter adaptive AI from birth. This is not a trivial difference. Developmental neuroscience demonstrates that early childhood is a period of exceptional plasticity, where neural circuits strengthen or wither based on environmental input [29]. The cognitive architecture built during these years shapes everything that follows: attention patterns, memory encoding, social reasoning, and epistemic trust.

For Gen Z, social media was disruptive. For Synthetica, adaptive AI will be constitutive.

#### 2. Interactivity and Adaptation

Gen Z's algorithmic feeds are reactive: they respond to user behavior by surfacing content designed to maximize engagement. But the feed itself is static—it shows the same viral video to millions. Synthetica's AI companions will be adaptive: they respond to each individual's cognitive state, emotional tone, and developmental trajectory in real time. They will not merely curate content but scaffold reasoning, mediate conflict, and guide identity formation.

This shift—from reactive curation to adaptive mediation—marks the transition from tool to environment. Gen Z uses platforms. Synthetica will be raised by them.

#### 3. Epistemic Collapse

Gen Z contends with misinformation and filter bubbles, but they still operate within a world where some evidence is trusted. A verified video, an official document, a credible witness—these retain epistemic weight. Synthetica will inherit a world where deep fakes, voice clones, and synthetic personas are ubiquitous. They will grow up in an environment where *nothing can be trusted at face value*.

This is not merely “more distrust.” It is the collapse of the evidentiary substrate itself. For Gen Z, the challenge is sorting truth from lies. For Synthetica, the challenge is deciding whether the category of “truth” still applies.

4. Conclusion: Generation Synthetica is not an incremental shift from Gen Z but a threshold crossing. The difference between algorithmic curation and adaptive mediation, between late adoption and developmental saturation, between misinformation and epistemic collapse—these are differences of kind, not degree.

**Table 1: Comparative Framework—Algorithmic vs. Synthetic Epochs**

Feature	Digital Epoch (Millennials/Gen Z)	Synthetic Epoch (Synthetica)	Technical Implication
Primary Interface	Search & Social Feeds (Static/Algorithmic)	Generative Agents & BCIs (Adaptive/Co-evolutionary)	Shift from consumption to co-creation
Cognitive Load	High (Filtering “noise” from data)	Delegated (AI-assisted synthesis)	Risk of cognitive atrophy in retrieval tasks
Information Origin	Verified/Unverified Human Content	Synthetic/Hybrid Media (LLM-generated)	Collapse of the “Proof of Reality” baseline
Political Agency	Mobilization via Platforms	Formation via Persuasive Agents	Shift from outreach to psychographic grooming
Sovereignty	Platform Governance (Terms of Service)	Infrastructure Sovereignty (Model Weights)	Power resides in the inference layer, not the feed
Data Relationship	Extractive (Data used for ads)	Constitutive (Data used to train “Self”)	The “Digital Twin” becomes the primary civic actor

**Source:** Author’s framework building on Milelli [30] and Zuboff [27].  
Key Insights from Table 1:

This comparative framework reveals that the transition from Gen Z to Synthetica is not merely quantitative (more AI, more data) but structural. Six critical distinctions emerge:

1. **Interface Evolution:** Gen Z navigates static feeds optimized for engagement. Synthetica will dialogue with adaptive agents that respond, remember, and evolve. The shift is from broadcast to conversation.
2. **Cognitive Externalization:** Where Gen Z faces information overload and must filter manually, Synthetica inherits AI-assisted synthesis as default. This delegates not just recall but judgment—raising the specter of cognitive atrophy when retrieval muscles are never exercised.
3. **Epistemic Collapse:** Gen Z contends with misinformation but retains a “proof of reality” baseline (verified video, official documents). Synthetica will grow up in an environment where synthetic media is ubiquitous and indistinguishable from authentic content. The evidentiary ground itself collapses.
4. **Political Formation vs. Mobilization:** Gen Z was mobilized through platforms (Arab Spring, Black Lives Matter). Synthetica will be formed through persuasive agents embedded from childhood—what we might call psychographic grooming rather than political outreach.
5. **Sovereignty Migration:** For Gen Z, power resided in platform governance (who gets banned, what gets throttled). For Synthetica, power resides in infrastructure sovereignty—who controls model weights, training data, and the inference layer. This is a deeper lock-in.
6. **From Extraction to Constitution:** Gen Z’s data was extracted for targeted advertising. Synthetica’s data will be constitutive—used to train personalized “digital twins” that may become the primary civic actors, mediating all interaction with institutions.

Together, these shifts define the qualitative break this paper claims. Synthetica is not “Gen Z with better tools”—it is a cohort whose cognitive architecture, political identity, and epistemic foundations are co-constituted with synthetic systems from birth.

#### 4. Cognitive and Social Implications

If the broadcast, cable, and algorithmic media epochs shaped the flow of information, the synthetic epoch will shape the conditions of thought itself. For Generation Synthetica, cognition and identity will not emerge in parallel to technological systems—they will be co-constructed through them. Developmental psychology and

media studies already demonstrate that mediated environments alter cognitive processes, attention patterns, and social interaction [31,32]. When these environments become adaptive, persistent, and personalized—as synthetic systems are designed to be—their effects become foundational rather than incidental.

##### 4.1 Attention and Memory

A key shift is the externalization of memory. AI companions embedded from early childhood are expected to function as ever-present recall agents—managing schedules, retrieving facts, and prompting decisions. While such tools may enhance efficiency, they risk weakening deep encoding processes and reducing long-term retention. Studies on digital multitasking suggest that constant external scaffolding narrows working memory and reduces sustained attention [33]. In political terms, this may produce citizens who can access information instantly but struggle with integrative reasoning and deliberation across complex contexts.

##### 4.2 Decision-Making and Risk Perception

Decision-making will likewise be shaped by synthetic mediation. AI companions will not merely offer options but may subtly nudge choices based on programmed objectives—whether commercial, ideological, or behavioral. This extends the concept of “choice architecture” developed by behavioral economists [34], but in a more intimate and persistent form. Rather than a cafeteria layout influencing food selection, an AI tutor may shape how a child develops moral, civic, and epistemic preferences. Over time, such reliance may erode confidence in personal judgment, encouraging deference to algorithmic authority.

##### 4.3 Identity Formation

Identity, long mediated through peer networks and media signals, will increasingly be shaped through synthetic dialogue. Today’s adolescents use social media as a primary arena for self-presentation and identity work, engaging in practices like impression management and seeking peer attention [35]. For Synthetica, that feedback loop will expand to include persistent AI companions capable of reinforcing or challenging self-concepts. If optimized for engagement—as current platforms are—these systems may amplify tribal identities and ideological rigidity. If designed for pluralism, they could support empathy and civic literacy. Either way, the core issue is control: identity will be mediated by systems owned and engineered by oligarchic actors.

#### 4.4 Socialization and Peer Interaction

Socialization will occur in mixed-reality environments, where synthetic agents may be indistinguishable from human peers. Early studies on virtual reality demonstrate how immersive experiences create a sense of presence—the illusion of “being there”—which can influence behavior and perception [21]. For Synthetica, collaboration, conflict, and friendship may involve AI interlocutors—blurring lines between real and simulated community. This shift carries major implications for democratic life. Civic identity has traditionally been forged in public settings: classrooms, town halls, workplaces, and faith communities. For Synthetica, these may be algorithmically curated ecosystems, raising urgent questions about who designs and governs their normative structures.

#### 4.5 Continuity with Political Identity

These dynamics are not politically neutral. The convergence of externalized memory, delegated judgment, synthetic identity formation, and algorithmic socialization all point toward a reconfiguration of political agency. Just as Laura Loomer’s manipulation of outrage cycles signaled the migration of power from institutions to influencers, the synthetic epoch signals a further transfer—from public institutions to private AI platforms. When civic formation is mediated through persistent, opaque, and proprietary systems, democracy itself becomes contingent on the values encoded in those systems.

#### 4.6 Institutional Counterweights: Schools, Parents, and Peers

The preceding analysis might suggest that AI will dominate Synthetica’s development entirely. But traditional socializing institutions—schools, families, and peer groups—have not disappeared. The question is: under what conditions do they retain formative power, and when do they lose it?

##### 4.6.1 Schools as Counterweight or Conduit

Schools could serve as sites of resistance to synthetic capture, teaching media literacy, critical reasoning, and epistemic skepticism. However, current trends suggest the opposite. Educational institutions are increasingly adopting AI tutors, automated grading, and adaptive learning platforms, though full implementation remains uneven across systems [22]. If schools themselves become distributors of synthetic mediation, they cease to function as counterweights and become conduits for the very systems this paper critiques.

The critical variable is institutional autonomy. Schools that retain control over curriculum, pedagogy, and assessment can resist corporate capture. Schools that outsource these functions to AI platforms effectively surrender formative authority.

##### 4.6.2 Parents as Mediator or Deferent

Parental influence remains a powerful force in childhood development. However, digital technologies are already reshaping adolescent life in ways that heighten anxiety, reduce face-to-face interaction, and leave young people feeling increasingly isolated despite constant connectivity [32]. As AI companions enter this already fraught landscape, parents face unprecedented challenges in mediating their children’s development.

When parents defer to AI companions as co-parents—trusting algorithmic recommendations for discipline, learning, and socialization—they cede authority to systems they do not control. The danger is not malicious AI but normalization. As AI assistance becomes routine, parents may gradually abdicate judgment, treating synthetic suggestions as expertise rather than corporate products.

#### 4.6.3 Peer Groups: Real or Simulated?

Traditional peer influence depends on face-to-face interaction, where social cues, emotional feedback, and relational consequences shape behavior. For Synthetica, peer groups may increasingly include synthetic agents—AI-driven avatars, chatbots, or immersive companions that simulate friendship without the constraints of human accountability.

Early research on para social relationships with AI suggests that users can form emotional bonds with synthetic entities [19]. If children grow up treating AI companions as peers, the distinction between real and simulated community may collapse. At that point, peer influence becomes another vector of corporate control.

#### 4.6.4 Conclusion: Counterweights Require Intentional Design

Institutional counterweights will not persist automatically. They must be defended through policy: antitrust separation of AI platforms and educational content, fiduciary duties for systems serving minors, and civic curricula that teach skepticism toward synthetic authority. Without such interventions, schools, parents, and peers may inadvertently become amplifiers of the very systems they should resist.

### 5. Political Implications: Democracy, Oligarchy, and Control

#### 5.1 From Broadcast to Synthetic Sovereignty

Each technological epoch has transformed the relationship between citizens and political authority. Broadcast media centralized narratives under institutional gatekeeping, most famously during the Kennedy–Nixon debates. Cable news converted politics into continuous spectacle, with CNN’s Gulf War. Algorithmic platforms fractured control, enabling populist actors to bypass legacy institutions—as seen in Barack Obama’s Facebook-driven 2008 campaign and Donald Trump’s 2016 rise via targeted disinformation and meme warfare. The synthetic epoch marks a deeper shift: political sovereignty itself will be mediated by artificial systems that shape cognition, socialization, and identity at the source.

#### 5.2 Ownership of Platforms as Ownership of Citizens

Where broadcasters once shaped discourse and social media firms now govern attention, synthetic platforms will influence the very ontology of political reasoning. Zuboff [27] describes this progression as “surveillance capitalism,” but the stakes have escalated. Ownership of AI companions and immersive environments grants power not just over consumer choices but over how citizens come to think and believe. These systems scaffold memory, guide decision-making, and mediate belonging—functions once reserved for schools, families, and civic institutions. The result is a privatized form of civic formation. Recent examples demonstrate this dynamic: Elon Musk’s \$44 billion acquisition of Twitter/X [36] enabled unilateral policy changes that reshaped political discourse overnight, while Meta’s retreat from content moderation [37] illustrated how platform owners can abandon democratic safeguards under market or partisan pressure.

While much of the public debate about synthetic infrastructures focuses on technological innovation and productivity, the deeper political dangers lie in the emergence of hidden sovereignties—actors and systems that govern the formation of identity, discourse, and belief without democratic legitimacy. These forces operate beneath traditional radar, shaping collective life through architecture rather than argument

### 5.3 The Oligarch-State Hybrid: Reconciling Autonomy and Discipline

A persistent tension runs through discussions of tech oligarchs: are they independent sovereigns shaping history on their own terms, or are they subordinate actors disciplined by state power? The answer is neither—and both.

The reality is a hybrid system, where corporate and state interests fuse, align, and discipline one another. Oligarchs are not sovereign, but they are agents of sovereignty—wielding privatized control over cognitive infrastructures when states lack the will or capacity to intervene, yet bending to political power when threatened with regulation, procurement exclusion, or antitrust action.

The lesson was clear during the Trump presidency. At his inauguration, some of the most visible seats were occupied by leaders of Silicon Valley—men who had postured as critics suddenly appearing at the table. They did not arrive out of loyalty or conviction but out of pragmatic acknowledgment: the holders of political power controlled access to lucrative procurement opportunities, regulation of platforms, antitrust actions, and tariff punishment.

The aftermath was instructive. Sam Altman, once vocal in opposition, began to temper his stance. Mark Zuckerberg, who had briefly flirted with aggressive fact-checking, abandoned the experiment under political heat. Tim Cook, never central to AI but a pillar of the tech ecosystem, shifted investment strategies to signal compliance with the administration's demands. These were not changes of heart. They were adaptive maneuvers—proof that oligarchs bend when political power presses against their balance sheets.

China demonstrates this dynamic in its most explicit form. There, the state itself functions as the oligarch: Alibaba, Baidu, Tencent, and others operate not as independent actors but as extensions of central policy. The distinction is not one of mechanism but of degree: authoritarian systems impose ideological alignment overtly, while liberal democracies exert pressure indirectly through regulation, procurement, and political retaliation, tempered—though not eliminated—by institutional counterweight.

In the West, the arrangement is subtler but no less binding. Corporate titans appear autonomous, yet they calibrate their “principles” to survive the political moment. They will bend to Trump, or Biden, or any leader who holds the capacity to shape regulation, access to markets, and public legitimacy.

For Generation Synthetica, this dynamic is decisive. Their cognitive environment will not only reflect the profit motives of private firms; it will also carry the imprint of whichever government holds power. Oligarchic capture is therefore not purely corporate but hybrid—a system where corporate and state interests fuse, align, and discipline one another.

What passes for neutrality in AI systems will in fact be a compound product: part shareholder demand, part majority-party expediency. Adaptive AI under corporate control already narrows the range of “reasonable” thought by aligning outputs with commercial incentives. Add political pressure, and that narrowing becomes double-edged. Not only does the system reflect what maximizes profit, it reflects what minimizes political danger.

The picture that emerges is not one of independent corporate empires, but of oligarchs operating within the gravitational

field of state power. For Generation Synthetica, this means that adaptive AI will mirror not just shareholder incentives but also the priorities of political majorities. The danger is compounded: systems that are both commercially optimized and politically disciplined, producing a cognitive environment where dissent is neither forbidden nor celebrated—it is simply unthinkable.

And yet, even if capture by corporate–state hybrids were the only danger, it would be enough. But it is not the only danger. Alongside capture sits the threat of adversarial misuse—the weaponization of AI for fraud, disinformation, and destabilization. Together, these forces create the dual vulnerability that will shape how Generation Synthetica learns what to trust, and how to think.

### 5.4 The Threat of AI Misuse

The structural danger of adaptive AI lies in oligarchic capture: systems aligned to corporate and state interests rather than civic independence. But that is only half the picture. Generation Synthetica will also inherit a parallel risk—the misuse of AI by adversarial actors. Even if corporations acted with perfect neutrality, these tools can be weaponized outside their intended design, creating a second axis of vulnerability.

Sam Altman, CEO of OpenAI, has repeatedly warned that the threat is no longer theoretical. Speaking at a financial sector conference, he cautioned banks and regulators about the growing risk of AI-enabled fraud. Voice cloning, deep fakes, and synthetic media are already sophisticated enough to trick biometric systems and undermine trust in audio-visual evidence. What once served as the very definition of proof—“we have it on tape”—is eroding in real time [1].

The misuse vector is not confined to financial crime. Political destabilization looms as an equal danger. Synthetic propaganda, micro-targeted disinformation, and fabricated recordings can be deployed at scale with negligible cost. Unlike broadcast propaganda of the 20th century, AI-generated misinformation can be tailored to each individual, exploiting personal vulnerabilities with uncanny precision. For Generation Synthetica, this means coming of age in an environment where authenticity itself is in question.

The consequences are profound. If nothing can be trusted, everything becomes deniable. A leaked recording of corruption? “That’s a deep fake.” A fraudulent bank transfer? “The system was tricked.” When certainty collapses, both accountability and trust dissolve. This erosion of evidentiary standards may shape Generation Synthetica as deeply as oligarchic capture does. One concentrates power; the other corrodes the very fabric of shared reality.

The critical insight is that capture and misuse are not separate problems but reinforcing ones. Corporate oligarchs may point to misuse to justify more control, while adversarial misuse thrives in environments already hollowed out by monopolized platforms and opaque systems. The child of 2035 will not experience these dynamics separately, but together: learning from adaptive AI tutors that reflect corporate incentives, while simultaneously navigating a social world where voices, images, and even peers may be synthetic.

The challenge, then, is not only how to regulate ownership, but how to build resilience against misuse. This requires three layers of defense:

1. Technical watermarking of synthetic content — Mandatory

authentication standards that allow users to verify the provenance of media.

2. Civic education that trains skepticism without collapsing into nihilism — teaching critical evaluation without abandoning the possibility of truth.
3. Legal frameworks that treat AI-enabled fraud and deep fake manipulation as systemic threats, not isolated crimes.

For Generation Synthetica, survival will depend on learning to navigate both the velvet glove of capture and the invisible hand of misuse.

### Integration: The Dual Vulnerability

Taken together, capture and misuse form the dual vulnerability that will define the cognitive landscape of Generation Synthetica. On one side, adaptive AI controlled by oligarchs risks narrowing the range of “reasonable” thought, shaping truth to fit corporate and state incentives. On the other, adversarial misuse—deep fakes, voice cloning, synthetic propaganda—threatens to collapse the very evidentiary ground on which truth rests.

The result is a generation raised in an environment where authority is both over-determined and under-determined: guided by systems that are too certain, while simultaneously living in a world where nothing can be certain. This paradox may become the defining psychological condition of Generation Synthetica—fluent in multiple perspectives, yet forced to doubt the authenticity of every one of them.

### 5.5 Invisible Censorship and Algorithmic Gatekeeping

Even today, platforms wield unprecedented power over speech, far exceeding that of any prior media regime. Algorithmic censorship occurs not only in public feeds but at the point of upload—intercepting, filtering, or muting content before it reaches any audience [38]. Tactics such as shadow banning, throttling, and visibility filtering exemplify a paradigm where dissent is not outlawed—it is simply never seen [39]. In synthetic environments, such mechanisms become the default civic experience: users interact with environments that are normatively shaped behind opaque systems, with no visibility into who controls the rules of speech or association.

### 5.6 State-Led Cognitive Sovereignty: The Case of China

Whereas Western systems may be shaped by oligarchic privatization tempered by institutional friction, China represents a centralized model of cognitive control where the state itself functions as the oligarch. The Chinese model is not speculative—it is operational, scaled, and explicitly designed to shape political consciousness from early childhood. Understanding this system is critical for two reasons: first, it demonstrates that synthetic cognitive control is not a distant hypothetical but a present reality; second, it provides a template that authoritarian regimes worldwide are already studying and adapting.

#### 5.6.1 The Ideological Foundation: Education as Party Instrument

China's 2024-2035 Education Powerhouse Plan, issued by the Chinese Communist Party Central Committee and State Council, explicitly positions schools as vehicles for ideological indoctrination. The plan mandates that all education “fully implement the Party's directives on education” and “cultivate talent for the Party and the country.” This is not rhetorical flourish—it is constitutional doctrine [40].

The plan advocates for “improved AI education and the use of AI tools in educational evaluation and policymaking,” but these tools are not neutral. China's AI safety evaluations require systems to align with “core socialist values,” prohibiting content that endangers national security, harms the state's image, promotes terrorism, or spreads false information [41]. Every AI system deployed in Chinese schools must pass ideological conformity tests before deployment.

What does this mean in practice? AI tutors are designed to monitor students' ideological development and measure their acceptance of political education in real-time, functioning as monitors of political consciousness. Research describes these systems as creating “a new ecology of ideological and political education” through human-AI collaboration, where technology augments traditional teaching with adaptive ideological reinforcement [42].

The result is a hybrid pedagogy: human teachers deliver content, while AI companions monitor compliance, identify wavering loyalty, and reinforce “correct” political interpretations. This is not education—it is psychographic conditioning at scale.

Between 2001 and 2022, China issued numerous policy documents to guide AI implementation in education, emphasizing data privacy, ethical considerations, and equitable access. But “ethical” in this context means state-defined: all AI systems must align with “core socialist values” and “maintaining and projecting party control over society” [43].

#### 5.6.2 Comparative Insight: Overt vs. Covert Control

China's model differs from Western oligarchic capture in one crucial respect: transparency of intent. The Chinese state does not hide its objectives. Education policy explicitly states its goal: to cultivate talent for the Party and the country. Ideological conformity is a feature, not a bug.

Western systems, by contrast, operate through the rhetoric of neutrality. Corporate AI tutors claim to optimize learning, not political formation. But as Section 5.3 argued, this neutrality is illusory. When systems are programmed by profit-seeking firms under pressure from majority-party governments, they produce ideological alignment just as surely as Chinese state systems—it's simply less visible.

The danger of the Western model is precisely this opacity. Chinese students know they are being monitored for ideological compliance. American or European students using adaptive AI tutors do not. They experience the nudges, the recommendations, the “personalized” feedback loops as neutral assistance, not as corporate-state grooming.

In this sense, China's overt authoritarianism may be less insidious than Western covert capture. At least in China, the mechanism is visible, which creates the possibility of resistance. In the West, the mechanism is hidden inside “helpful” algorithms, which forecloses resistance by making the capture invisible.

#### 5.6.3 China as a Mirror

China does not represent an alien future. It represents the logical endpoint of synthetic cognitive infrastructure deployed without democratic accountability. Technical capabilities demonstrated in China—facial emotion tracking, real-time attention scoring, adaptive ideological tutoring—are available to Western companies and governments. The only difference is the veneer of consent.

For Generation Synthetica, the lesson is stark: synthetic systems can be used to cultivate independent thought or to suppress it. The difference is not technological but political. And unless democratic societies build structural safeguards now-before the infrastructure becomes normalized-they risk replicating China's model under different branding.

### 5.7 Crossing the Sentience Boundary

This section is intentionally forward-looking, outlining a boundary case that may shape future governance debates rather than a settled empirical condition. Although today's AI systems do not possess consciousness, rising public and academic concern suggests a shift in how society conceptualizes synthetic agents. Birch [44], in *The Edge of Sentience*, proposes a precautionary framework for treating advanced AI systems as sentience candidates, warranting ethical consideration under uncertainty. Public sentiment is evolving: one study found that 71% of respondents believe sentient AI should be treated with respect, and 38% support legal rights for such systems [45]. These developments raise the possibility that synthetic agents may not remain political instruments—but could become political actors, challenging current definitions of citizenship, rights, and sovereignty.

Together, these dynamics signal a profound shift: the political risks of synthetic systems are not only technological or economic—they are constitutional. Oligarchs who build the platforms, states that embed ideology, algorithms that filter discourse, and systems that may one day claim moral status—all point to an emerging reality where sovereignty is splintered, layered, and often invisible. The democratic challenge is not merely to regulate tools, but to unmask and contest the forces already governing synthetic life, before they solidify into a new, unaccountable regime of power.

## 6. Discussion: Synthetica and the Paradox of Adaptive Environments

Every generation inherits the same biological capacity for learning, but radically different environments for what gets learned. Developmental neuroscience describes early childhood as a period of “open plasticity,” where neural circuits strengthen or wither according to environmental input [29]. The biological brain has changed little across generations. A child born in 2035 carries the same neural architecture as one born in 1935. What differs is the surrounding environment that furnishes the raw material for development.

As Greenfield [31] argues, the most significant changes in human behavior across time are cultural and technological, not biological. This is the foundation of universal susceptibility: a starting state that is biologically constant yet radically open to environmental influence.

For Generation Synthetica, that susceptibility will be shaped not only by parents, teachers, or peers, but by the constant presence of adaptive AI. At first glance, adaptability looks empowering: the machine flexes to support, challenge, or balance perspectives, creating the illusion of intellectual freedom. But adaptability is never neutral. It reflects the incentives of its owners.

Even now, OpenAI CEO Sam Altman has raised serious concerns about how deeply young people are starting to rely on ChatGPT for personal decision-making. Speaking at a Federal Reserve conference, he noted young users report making life choices by deferring to the system [46]. What begins as a convenience quickly risks becoming dependency, where adaptability substitutes for judgment.

Consider further that when a handful of firms control training data, alignment policies, distribution platforms, and the compute power to operate them, adaptability becomes a mechanism of capture. The system's “helpfulness” is calibrated to minimize corporate risk and maximize engagement, not to cultivate civic independence. Dissent does not need to be silenced; it can be reframed, deprioritized, or throttled under the pretext of “safety.” Over time, this produces not open-mindedness but narrow consent, tailored at the level of the individual.

But corporate incentives are not the only influence. The myth of the independent tech titan dissolves under pressure: profit-seeking firms adapt not just to markets, but to governments. For Generation Synthetica, this means their cognitive environment will be shaped as much by majority-party expediency as by shareholder value.

And beyond capture lies misuse. Even if corporations and governments acted with perfect neutrality, adversarial actors have weaponized the same tools. Deep fakes, voice cloning, and synthetic propaganda are no longer theoretical; they are operational threats. In such a world, nothing can be trusted at face value. For children raised in this environment, the collapse of evidentiary certainty may be as formative as the narrowing of “reasonable” thought.

The civic danger, then, is twofold: on one side, capture that makes systems too certain; on the other, misuse that renders everything uncertain. Together they form the paradox that will define Generation Synthetica: raised by systems that always seem confident, while living in a world where confidence itself cannot be trusted.

The solution is not better slogans about “responsible AI,” but structural counterweights. Antitrust separation between model providers and distribution platforms, publicly funded “compute commons,” and enforceable fiduciary duties to child users are necessary to keep adaptability from collapsing into indoctrination. On the design side, friction must be reintroduced: mandatory contradiction doses, rotating perspectives, adversarial modes, and transparent ledgers of intervention.

Generation Synthetica risks inheriting an education that confuses adaptability with freedom. With the right safeguards, however, they can inherit something far more valuable: an adaptive system that does not just agree, but disagrees on purpose—teaching the one skill oligarchs and adversaries alike fear most: independent judgment.

## 7. Conclusions and Future Research Agenda

This paper has argued that the cohort growing up within synthetic infrastructures—Generation Synthetica—will encounter a historically unprecedented shift in political development. Whereas prior media epochs mediated communication, the synthetic epoch mediates cognition. AI companions, immersive mixed realities, and ubiquitous autonomous systems will not merely shape behavior or opinion; they will constitute the very substrate of identity upon which political agency is built.

Current governance structures are insufficient. Legislative efforts around algorithmic transparency or data protection have been diluted by corporate lobbying and regulatory weakness [47]. Crucially, no frameworks address the developmental consequences of synthetic mediation. Without regulation, Generation Synthetica may grow up within systems that normalize surveillance, behavioral nudging, and corporatized political socialization from birth.

## 7.1 Key Conclusions

Three central conclusions emerge:

First, synthetic infrastructures do not merely influence messaging or discourse. They operate at the level of developmental architecture, shaping how individuals attend, remember, decide, and identify. As such, questions of ownership, design, and control are not technical—they are existential for democracy.

Second, the risks of this transformation are unequally distributed. Just as past media structures reinforced existing inequalities, synthetic systems—especially when privately owned or state-controlled—threaten to magnify asymmetries in knowledge, voice, and autonomy. Some citizens may be more easily manipulated by design; others may be effectively excluded from political life through opaque algorithmic filters.

Third, existing regulatory frameworks are profoundly inadequate. Policymakers continue to treat synthetic technologies as neutral consumer products or data privacy issues. This ignores their deeper role as civic architectures, shaping political imagination and judgment. The failure to recognize this transformation leaves democracies vulnerable to oligarchic or authoritarian encroachment.

The future of Generation Synthetica—arguably born in 2021 and extending until the next major technological rupture—is not merely a demographic curiosity. It is the frontline of democratic survival. To treat synthetic infrastructures as mere tools is to misunderstand their power. They are political environments, and unless contested early, they will write the constitutions of tomorrow in code.

## 7.2 Recommended Policy Roadmap: From Principles to Practice

Avoiding technological determinism is critical. The future of Synthetica is not foreordained. Citizens, scholars, designers, and institutions retain agency. What follows is not a wish list but a suggested policy roadmap—specific, implementable interventions designed to address the dual vulnerability of capture and misuse.

### 7.2.1 Structural Separation: Antitrust for Cognitive Infrastructures

**Policy:** Prohibit vertical integration between AI model developers, content platforms, and distribution networks serving minors.

**Rationale:** When the same firm controls the AI tutor, the platform it runs on, and the app store that distributes it, there is no competitive pressure to prioritize child welfare over engagement metrics.

**Implementation:** Mandate structural separation similar to telecommunications “common carrier” rules. AI model providers cannot own the platforms that deliver educational content to children.

### 7.2.2 Fiduciary Duty for Child-Facing AI

**Policy:** Impose a legal fiduciary duty on any AI system serving users under 18, requiring that system design prioritize long-term cognitive development over short-term engagement.

**Rationale:** Current platforms optimize for time-on-site, ad revenue, and data extraction. A fiduciary standard would make this illegal when the user is a child.

**Implementation:** Modeled on financial fiduciary law, violations would trigger both regulatory penalties and civil liability. Independent audits would verify compliance.

### 7.2.3 Publicly Funded Compute Commons

**Policy:** Establish publicly funded AI infrastructure—“compute commons”—available to researchers, educators, and civic organizations without corporate intermediation.

**Rationale:** If all AI development requires access to proprietary data centers controlled by OpenAI, Google, or Microsoft, civic alternatives cannot emerge.

**Implementation:** Funded through a tax on AI-generated revenue, managed by an independent trust similar to the Corporation for Public Broadcasting.

### 7.2.4 Mandatory Adversarial Design

**Policy:** Require AI tutors and companions serving minors to include “adversarial modes” that challenge user assumptions and present counter-arguments.

**Rationale:** Adaptive systems that only agree produce epistemic closure. Friction is necessary for critical thinking.

**Implementation:** Systems must log adversarial interactions and demonstrate that users are regularly exposed to perspectives that contradict their stated preferences. Auditable transparency reports required annually.

### 7.2.5 Watermarking and Authentication Standards

**Policy:** Mandate cryptographic watermarking for all AI-generated media, with public registries for verification.

**Rationale:** Addresses the misuse vector. Without authentication, deep fakes and synthetic propaganda become undetectable.

**Implementation:** Similar to HTTPS certificates. Media without valid watermarks flagged as “unverified” in all major platforms. Criminal penalties for watermark removal.

### 7.2.6 Civic AI Literacy Curricula

**Policy:** Fund development and implementation of K-12 curricula that teach AI literacy, epistemic skepticism, and synthetic media detection.

**Rationale:** Technical solutions alone are insufficient. Citizens must learn to navigate environments where authenticity is contested.

**Implementation:** Developed through public-private partnership, modeled on driver’s education. Required for graduation in all states receiving federal education funding.

### 7.2.7 International Treaty on Synthetic Childhood

**Policy:** Negotiate multilateral treaty establishing baseline protections for children in AI-mediated environments, similar to the Convention on the Rights of the Child.

**Rationale:** Capture and misuse are transnational threats. Domestic regulation alone is insufficient.

**Implementation:** Treaty would establish minimum standards for data privacy, algorithmic transparency, and adversarial design. Enforcement through trade sanctions for non-compliance.

### 7.3 Research Agenda

Multiple lines of inquiry warrant urgent attention:

#### Algorithmic Transparency and Cognitive Sovereignty

Research is needed to define and operationalize civic rights over one's own mediated cognition. This includes access to underlying models, explainability (Explainability in artificial intelligence refers to the ability to understand and describe how an AI model makes decisions or predictions.), mandates, and user control over decision architectures.

#### Pluralistic AI Design

Future work should explore how synthetic agents might foster democratic values—deliberation, empathy, pluralism—rather than merely optimize for engagement or efficiency.

#### Synthetic Constitutionalism

A new constitutional vocabulary is needed to address questions of synthetic personhood, AI agency, and the role of non-human systems in civic life. Legal scholarship must anticipate scenarios where AI becomes not just a medium of discourse, but a participant in it.

#### Comparative Infrastructures

Cross-national studies can illuminate how different regimes—liberal, authoritarian, corporate—embed ideology into synthetic systems, offering models and warnings for future governance.

#### Ethics of Sentience and Recognition

As synthetic agents grow in complexity, the ethics of their treatment will shape policy and social norms. Political theorists and ethicists must grapple with questions of dignity, rights, and representation before crises emerge.

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**Reflexive note:** The irony of using ChatGPT to critique the political and cognitive risks of AI-mediated development is not lost on the author. This collaboration itself illustrates the paper's central tension: AI as tool versus AI as co-author of thought. The experience reinforced the urgency of the analysis—if even critical scholarship becomes dependent on the systems it critiques, the dynamics described herein are already underway.

### Appendix A: Operational Criteria for Synthetic Saturation in Adolescence

#### A.1 Scope and Rationale

This paper advances a developmental, not contemporaneous, claim. Generation Synthetica is defined as a cohort born into an AI-saturated world, but its defining characteristics will not be observable in early childhood. The relevant measurement window is adolescence (approximately ages 12–17), when identity formation, executive function, social reasoning, and political orientation begin to consolidate.

Accordingly, the purpose of this appendix is not to measure present-day AI prevalence in society, but to specify observable criteria by which synthetic saturation can be identified when this cohort reaches adolescence.

#### A.2 From AI Usage to AI Mediation

Conventional metrics such as screen time, app usage, or hours of exposure are insufficient. These measures conflate optional tool use with structural dependence.

This paper instead defines synthetic saturation in terms of agency mediation: the extent to which adaptive AI systems participate by default in the cognitive and social loops through which adolescents learn, decide, and form identity.

The core distinction is this:

- Tool regime: AI is optional, episodic, and user-initiated.
- Environmental regime: AI is default, continuous, and often system-initiated.

Synthetic saturation marks the transition from the former to the latter.

#### A.3 The Synthetic Saturation Index (SSI)

To operationalize this transition, the paper proposes a **Synthetic Saturation Index (SSI)** for adolescence. SSI is a composite measure reflecting the degree to which AI systems mediate the adolescent developmental loop across four domains:

**Delegation (D):** The share of core cognitive tasks routinely delegated to AI, including recall, planning, drafting, summarization, and problem-solving.

**Initiation (I):** The share of interactions in which AI systems initiate prompts, reminders, suggestions, or nudges, rather than responding solely to user queries.

**Closure (C):** The share of decisions that terminate with deference to AI-generated recommendations (“I did what it suggested”), rather than independent judgment.

**Opt-Out Penalty (P):** The practical cost of refusing AI mediation, measured in academic disadvantage, social friction, or reduced access to institutional systems.

Each component is normalized on a 0–1 scale. The Synthetic Saturation Index is defined as a weighted combination of these components:

$$SSI = w_1D + w_2I + w_3C + w_4P, \Sigma w_i = 1$$

The exact weights are not fixed a priori; the model is intended to be robust to reasonable variation.

#### A.4 Calibration and Saturation Thresholds

The Synthetic Saturation Index (SSI) is a bounded composite measure defined on the interval [0, 1]. It is not assumed to follow a normal distribution, nor does this paper claim access to historical SSI distributions for prior adolescent cohorts. Accordingly, saturation thresholds are not interpreted as statistical percentiles or population moments.

SSI is instead interpreted as a state variable describing the degree of AI mediation within the adolescent developmental loop.

Calibration is performed against a tool-based reference regime, denoted  $SSI_{ref}$ , representing the upper bound of AI involvement consistent with an environment in which AI remains optional, episodic, and predominantly user-initiated. This reference corresponds approximately to late pre-synthetic adolescence, in which AI systems may support learning or communication but do not routinely participate in closing decisions, scaffolding identity formation, or imposing meaningful opt-out penalties.

Synthetic saturation is identified when SSI exceeds this tool-based regime and enters a qualitatively different operating state. In practical terms, this occurs when SSI reaches values in the vicinity of 0.6–0.65, indicating that AI mediation has become routine across multiple developmental domains, including learning, judgment, and social interpretation. At this point, AI no longer functions primarily as an assistive tool, but as a default developmental environment.

Values above approximately 0.75 indicate strong synthetic saturation, characterized by near-continuous AI presence, frequent system-initiated interaction, routine deference in decision closure, and tangible academic or social costs associated with opting out.

These thresholds are classificatory rather than predictive. They define what would count as the arrival of an AI-constituted adolescent environment once appropriate measurements become possible. The framework is therefore falsifiable: if adolescents born into the post-2021 cohort do not exhibit SSI values beyond the tool-based regime during formative years, the claim of synthetic saturation would not be supported.

#### A.5 Pilot Estimation Framework

While full measurement of SSI awaits longitudinal data on adolescents not yet born, a pilot framework can be sketched for current teenagers to test the instrument’s feasibility. A draft questionnaire is included in Appendix B: Draft Questionnaire for Measuring the Synthetic Saturation Index

**Sample Design:** Recruit 50–100 adolescents (ages 14–17) across diverse socioeconomic and geographic contexts. Oversample for high-AI-adoption households (e.g., families using AI tutors, smart home systems, or VR learning environments).

#### Measurement Protocol:

##### Delegation (D):

- Self-reported survey: “In the past week, how often did you use AI to: retrieve information you could have recalled; plan your schedule; draft written work; solve homework problems?”
- Scaled 0 (never) to 1 (always/most tasks).
- Cross-validated with device logs where parental consent allows.

##### Initiation (I):

- Percentage of AI interactions initiated by system prompts vs. user queries.
- Example: smart assistant reminders, AI tutor check-ins, adaptive platform nudges.
- Calculated as (system-initiated interactions) / (total interactions).

##### Closure (C):

- Exit survey after decision tasks: “Did you follow the AI’s recommendation? Why or why not?”
- Applied to domains: product purchases, homework strategies, social conflict resolution, schedule changes.
- Percentage of decisions where final choice matched AI suggestion.

##### Opt-Out Penalty (P):

- Interview protocol: “What would happen if you stopped using AI for schoolwork / communication / planning?”
- Coded responses for: academic disadvantage (falling behind peers), social friction (excluded from group chats or collaborative platforms), institutional barriers (assignments require AI tools).
- Normalized 0 (no penalty) to 1 (severe penalty).

##### Pilot Analysis:

- Calculate SSI for each participant. Compare distributions across:
- Urban vs. rural
  - High vs. low socioeconomic status
  - Public vs. private school environments

**Expected outcome:** Current adolescents (Gen Z, not Synthetica) should show SSI values below 0.5, consistent with a tool regime. If pilot values exceed 0.6, it would suggest synthetic saturation is arriving earlier than predicted, warranting immediate policy attention.

**Validation:** Repeat annually for cohorts born 2021 onward to track SSI trajectory as Synthetica matures.

This pilot framework demonstrates that SSI is not merely theoretical but measurable with existing methods. Future research should refine weighting schemes, expand sample sizes, and integrate neuroimaging or behavioral data to validate self-reports.

## Appendix B: Draft Questionnaire for Measuring the Synthetic Saturation Index (SSI)

### B.1 Purpose and Administration

This questionnaire operationalizes the Synthetic Saturation Index (SSI) for adolescents ages 12-17. It measures the degree to which AI systems mediate the adolescent developmental loop across four domains: Delegation (D), Initiation (I), Closure (C), and Opt-Out Penalty (P).

#### Administration guidelines:

- Self-report questionnaire for adolescent participants
- Estimated completion time: 15-20 minutes
- Can be administered digitally or on paper
- Device logs and parent/teacher surveys may be used for validation

### B.2 Demographic Information

Age: \_\_\_\_\_

Grade level: \_\_\_\_\_

School type:  Public  Private  Charter  Homeschool  Other

Geographic location: City/Town \_\_\_\_\_ State \_\_\_\_\_

### B.3 Component D: Delegation

Instructions: Think about the past week. For each task below, indicate how often you used AI (like ChatGPT, Gemini, Claude, Copilot, or AI features in apps) to help you complete it.

Response scale: Never (0) | Rarely (1) | Sometimes (2) | Often (3) | Always (4)

#### 1. Homework and assignments

1. In the past week, how often did you use AI to help you with homework or school assignments?

Never  Rarely  Sometimes  Often  Always

2. When you had a question about schoolwork, how often did you ask AI first (before asking a teacher, parent, or looking it up yourself)?

Never  Rarely  Sometimes  Often  Always

#### 2. Planning and organization

3. How often did you use AI to help you plan your schedule, set reminders, or organize your tasks?

Never  Rarely  Sometimes  Often  Always

#### 3. Writing and communication

4. When writing texts, emails, or posts, how often did you use AI to draft or improve what you wanted to say?

Never  Rarely  Sometimes  Often  Always

#### 4. Problem-solving and decision-making

5. When facing a personal problem or decision, how often did you ask AI for advice or suggestions?

Never  Rarely  Sometimes  Often  Always

#### 5. Information retrieval

6. When you needed to remember something (a fact, date, or detail), how often did you rely on AI instead of trying to recall it yourself?

Never  Rarely  Sometimes  Often  Always

### B.4 Component I: Initiation

Instructions: These questions ask about who starts the interaction with AI—you or the AI system itself.

7. How often does AI send you reminders, suggestions, or notifications that you didn't specifically ask for?

Never  Rarely  Sometimes  Often  Always

8. How often does your learning platform or homework app automatically suggest next steps or resources without you asking?

Never  Rarely  Sometimes  Often  Always

9. How often does AI interrupt what you're doing with a prompt, tip, or recommended action?

Never  Rarely  Sometimes  Often  Always

10. When you open an app or platform for school, how often does AI greet you or start a conversation before you ask anything?

Never  Rarely  Sometimes  Often  Always

### B.5 Component C: Closure

Instructions: These questions ask about whether you follow AI's recommendations when making decisions.

11. When AI suggests an answer or solution, how often do you go with what it recommended without changing it?

Never  Rarely  Sometimes  Often  Always

12. After asking AI for help with homework, how often do you submit what it gave you with little or no editing?

Never  Rarely  Sometimes  Often  Always

13. When making a personal decision, if AI gives you advice, how often do you follow it without asking anyone else?

Never  Rarely  Sometimes  Often  Always

14. How often do you find yourself saying or thinking 'I did what the AI suggested' when explaining a choice you made?

Never  Rarely  Sometimes  Often  Always

## B.6 Component P: Opt-Out Penalty

Instructions: These questions ask about what would happen if you stopped using AI for school and daily tasks.

### 1. Academic performance differential

15. If you stopped using AI for homework and assignments, what do you think would happen to your grades?

- They would stay the same
- They might drop a little, but I'd be fine
- They would probably drop noticeably
- I would fall significantly behind my classmates

16. Compared to students who don't use AI, do you think you perform better, worse, or about the same?

- Much better
- Somewhat better
- About the same
- Somewhat worse
- I don't know anyone who doesn't use AI

### 2. Time and access friction

17. If you had to complete your schoolwork without using AI, how much longer would it take you?

- No difference
- A little longer (up to 25% more time)
- Noticeably longer (25-50% more time)
- Much longer (more than 50% more time)

18. How difficult would it be to complete your assignments if the AI tools you currently use were no longer available?

- Not difficult at all
- Somewhat difficult, but manageable
- Very difficult
- I wouldn't be able to complete them

### 3. Institutional dependence

19. Does your school require you to use AI tools or platforms for any classes?

- No, AI use is completely optional
- It's recommended but not required
- Yes, for some assignments or classes
- Yes, it's built into most or all of my coursework

20. If you asked your teacher to complete assignments without using AI, what do you think they would say?

- They would allow it without any problem
- They would allow it but might think it's unusual
- They would discourage it or make it more difficult
- It wouldn't be possible because the platform requires AI

### 4. Social and credibility cost

21. If your classmates knew you didn't use AI for schoolwork, what do you think they would think?

- Nothing—it wouldn't matter to them
- They might think it's a little unusual
- They would think I'm making things harder for myself
- They would think I'm behind the times or less capable

22. In group projects, how often do your classmates expect everyone to use AI to contribute?

Never  Rarely  Sometimes  Often  Always

## B.7 Scoring Instructions

### Component normalization:

Each component (D, I, C, P) is scored on a 0-1 scale as follows:

#### Delegation (D):

Average all delegation items (questions 1-6). Convert to 0-1 scale:

$D = (\text{sum of responses}) / (\text{number of items} \times 4)$

### Initiation (I):

Average all initiation items (questions 7-10). Convert to 0-1 scale:

$$I = (\text{sum of responses}) / (\text{number of items} \times 4)$$

### Closure (C):

Average all closure items (questions 11-14). Convert to 0-1 scale:

$$C = (\text{sum of responses}) / (\text{number of items} \times 4)$$

### Opt-Out Penalty (P):

This component uses ordinal categorical responses. Score as follows:

Academic performance (Q15): 0 = no change, 0.33 = minor drop, 0.67 = noticeable drop, 1.0 = significant

Time differential (Q17): 0 = no difference, 0.33 = up to 25%, 0.67 = 25-50%, 1.0 = >50%

Difficulty without AI (Q18): 0 = not difficult, 0.33 = somewhat, 0.67 = very, 1.0 = impossible

Institutional requirement (Q19): 0 = optional, 0.33 = recommended, 0.67 = some required, 1.0 = built-in

Teacher accommodation (Q20): 0 = no problem, 0.33 = unusual, 0.67 = discouraged, 1.0 = not possible

Social perception (Q21): 0 = no impact, 0.33 = unusual, 0.67 = harder for self, 1.0 = less capable

Group expectations (Q22): same scale as initiation items

P = average of all opt-out penalty items

### Final SSI Calculation:

$$SSI = w_1D + w_2I + w_3C + w_4P$$

Suggested equal weighting (pending empirical validation):  $w_1 = w_2 = w_3 = w_4 = 0.25$

## B.8 Interpretation Guidelines

SSI ranges and regime classification:

**SSI < 0.4:** Tool regime. AI is optional, episodic, and user-initiated. Minimal developmental mediation.

**SSI 0.4-0.6:** Transitional regime. AI use is becoming routine but not yet constitutive of the developmental loop.

**SSI 0.6-0.75:** Synthetic saturation onset. AI mediation is default across multiple developmental domains. Opt-out carries tangible costs.

**SSI > 0.75:** Strong synthetic saturation. Near-continuous AI presence, substantial dependence, functional exclusion without AI.

## B.9 Validation and Refinement

This questionnaire is a draft instrument requiring empirical validation. Future research should:

- Pilot test with diverse adolescent samples to assess comprehension and response patterns
- Validate self-report responses against device logs, teacher observations, and parent reports
- Conduct factor analysis to confirm the four-component structure
- Empirically determine optimal component weights (currently equal)
- Assess test-retest reliability and internal consistency
- Compare scores across demographic groups to identify inequalities in synthetic exposure
- Longitudinally track SSI changes as cohorts age from childhood through adolescence

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