International Journal of Literature Studies
ISSN: 2754-2610
DOI: 10.32996/ijts
Journal Homepage: www.al-kindipublisher.com/index.php/ijls

IJLS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

From Scrolling to Sustained Reading: Digital Comics, Short-Form Video Culture, and the Transformation of Narrative Attention

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| ABSTRACT
This study explores narrative attention as mobile readers transition from passive scrolling on social media feeds to sustained reading in vertical digital comic environments. Addressing a critical gap in media ecology and cognitive media studies, the research examines how kinetic muscle memory and rapid visual habits cultivated within short-form video culture are repurposed to support long-form narrative immersion. Utilizing a hybrid qualitative framework that integrates visual social semiotics, ergodic narrative theory, and user experience (UX) structural mapping across platforms such as WEBTOON, Tappytoon, and GlobalComix, the study maps the spatial and cognitive mechanisms that facilitate this shift. Findings reveal that vertical webcomics utilize haptic continuity, adopting the single-hand vertical swipe normalized by short-form video platforms while altering its cognitive outcome. By manipulating vertical negative space (gutters), creators convert spatial distance into physical scrolling time intervals, inserting micro-pauses that regulate reading velocity and counteract rapid visual scanning. Furthermore, when automated short-form video feeds induce passive scroll immersion, working memory deficits, and executive fatigue, vertical digital comics restore active ergodic agencies through user-controlled scroll speed, pausing, and re-scrolling. Coupled with platform publishing models that structure complex serials into bite-sized Minimum Viable Story (MVS) units, vertical comic interfaces provide natural cognitive resting points that mitigate digital fatigue. Ultimately, this research demonstrates that screen-based scrolling can channel fragmented short-form attention into sustained, goal-directed narrative engagement.

| KEYWORDS
Digital Comics, Short-Form Video Culture, Narrative Attention, Ergodic Agency, Visual Social Semiotics, Cognitive Pacing

| ARTICLE INFORMATION
ACCEPTED: 19 September 2026 **PUBLISHED:** 21 October 2026 **DOI:** 10.32996/ijts.2026.6.6.6

1. Introduction

Online comics combine sequential images, written language, and digital interfaces. They include webcomics published on websites, vertically scrolling comics accessed via mobile apps, and digitized versions of printed comics. These categories overlap but should not be treated as identical. A scanned comic displayed on a computer and a webcomic designed for smartphone scrolling may require different navigation strategies and produce different reading experiences. Berube et al. (2024) therefore position webcomics as a subset of the broader category of digital comics and emphasize the interaction among content, device, and interface.

The current digital media environment is defined by an inherent tension between fragmented, algorithmically driven consumption and long-form immersion. While short-form video platforms (e.g., TikTok, Instagram Reels) have conditioned audiences to rapid context-switching, micro-pacing, and high-velocity visual stimulation, parallel shifts in mobile-first publishing have enabled massive engagement with serial narratives, particularly through vertical digital comics and webtoons.

The study explores the shift in media consumption by investigating how readers repurpose short-form scrolling habits to cultivate sustained narrative attention within vertical digital comic environments. Utilizing a qualitative multimodal discourse analysis alongside user interface (UI) pacing tracking across mobile webtoon platforms, this paper examines the structural and

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haptic mechanisms that facilitate this cognitive transition. In doing so, the study provides a critical framework for understanding modern digital literacy at the intersection of social media feeds and mobile-first literature.

2. Literature Review

Online comics appear to influence reading habits by making text more accessible, visually engaging, and adaptable to readers' everyday use of digital devices. However, empirical evidence is significantly stronger for immediate changes in reading motivation and situated user experiences than for lasting shifts in long-term reading frequency or literacy development. The central distinction lies between short-term engagement with a particular comic and the cultivation of a year sustained reading habit. While these outcomes are conceptually related, existing scholarship does not establish that immediate narrative engagement necessarily produces long-term habit formation (Berube et al., 2024; Robbani & Khoirotunnisa, 2021).

To establish a systematic foundation for this investigation, recent scholarship examining short-form video feeds, scrolling habits, and digital comic consumption on social media platforms is structured into four thematic trajectories: the architecture of the scroll: short-form video and neural attentional shifts, reading motivation, language learning, and voluntary participation; the material reality of digital comics: accessibility, haptics, and pacing; comprehension and processing efficiency: media vs. Format Dynamics.

2. 1. Scrolling and Neural Attention

Recent scholarship in cognitive media studies and platform neuroscience conceptualizes contemporary mobile screens as environments that recondition user attention through continuous feedback loops. Short-form video platforms operate primarily on algorithmic push models where pacing, duration, and content delivery are automated. Head (2025) provides a comprehensive narrative review tracking short-form video consumption from 2019 to 2025, showing how continuous streams of novel micro-content engage dopamine-driven reward circuitry and measurably reduce sustained attentional control. Complementing these behavioral findings with electroencephalogram (EEG) data, Yan et al. (2024) observe that high short-form video dependency correlates with diminished frontal theta neural activity during tasks requiring executive control and cognitive inhibition.

In narrative and platform theory, García-Cruz (2026) introduces the concept of the Minimum Viable Story (MVS)—the smallest complete narrative unit engineered to capture immediate engagement within high-velocity platform ecosystems. Within this attention economy, platforms prioritize instantaneous hook mechanics that rely on speed, minimal friction, and rapid cognitive rewards. However, while cultural critics often frame this environment as purely destructive to focus, subsequent media studies suggest that the physical gesture of scrolling—the haptic thumb-swipe—has evolved from a mechanism of frantic distraction into a foundational muscle memory applied across diverse digital text formats.

2.2. Reading Drive, Language Learning, and Spontaneous Engagement

One important contribution of online comics is their potential to make reading more appealing, particularly within additional-language learning contexts. Robbani and Khoirotunnisa (2021) utilized a descriptive qualitative approach involving semi-structured interviews to investigate online English comics as instructional and supplementary reading materials for university students in an English language education program. Their findings identified perceived benefits across several domains, including vocabulary expansion, grammar acquisition, reading comprehension, critical thinking, visual creativity, and intrinsic reading motivation. Furthermore, participants identified specific applications and digital platforms through which they routinely accessed English-language webcomics.

These empirical observations suggest that online comics can bridge language instruction with readers' pre-existing interests. Rather than presenting reading solely as an academic obligation, comics offer material that students choose voluntarily due to compelling narrative arcs and visual presentation. In this respect, online comics create crucial opportunities for voluntary reading beyond assigned coursework (Robbani & Khoirotunnisa, 2021). Nevertheless, the methodological design of the study limits the scope of its conclusions. Interview-based findings yield valuable evidence of reader perceptions and self-reported attitudes, but they do not constitute evidence that online comics directly enhance objective language proficiency or establish permanent reading routines. Consequently, the empirical consensus indicates that students perceive online comics as motivating and educationally useful, rather than that the medium reliably instills sustained reading habits across all learners.

2.3. The Materiality of Digital Comics : Accessibility, Haptics, and Pacing

Transitioning users from video-centric feeds to born-digital literature, recent research emphasizes how structural innovations in webcomics and vertical *manhwa* (webtoons) have redefined the comic medium for mobile devices. Benatti (2024), in foundational work mapping the evolution of digital comics, argues that born-digital webcomics are structurally liberated from traditional print constraints, utilizing digital-native formatting to shape narrative pacing directly through vertical space.

Expanding on the physical and cognitive interaction between reader and device, Berube et al. (2024) offer a comprehensive investigation into reader experiences, accessibility, and interface mechanics. Utilizing Human-Computer Interaction (HCI) frameworks alongside qualitative semi-structured interviews and reader-led think-aloud observations with five participants recruited through the British Library, their work shows how the vertical infinite canvas enables readers to construct "cognitive maps" that govern reading tempo and spatial immersion. Unlike the passive automated delivery of short-form video feeds, vertical digital comics give readers active agency over velocity; users decide when to pause, zoom, or re-scroll across the negative white space separating panels, turning the physical act of swiping into an instrument of sustained narrative absorption rather than fragmented scanning.

Furthermore, Berube et al. (2024) highlight that reading habits depend heavily on how easily reading fits into everyday life. Participants used diverse hardware configurations—including smartphones, tablets, laptops, and desktop computers—choosing devices based on the comic, the host platform, and the physical reading environment. While participants perceived digital comics as convenient and economical, these findings reflect situated user perceptions rather than population-level cost comparisons. Readers organized their routines around specific physical settings (e.g., using a tablet in a comfortable chair versus reading on a smartphone at the bedside), illustrating how online comics become integrated into recognizable daily contexts.

Finally, Berube et al. (2024) find that touchscreen gestures—such as swiping, tapping, scrolling, and guided panel-by-panel viewing—actively shape experiences of narrative pace, suspense, and emotional involvement. For instance, vertical scrolling on platforms like WEBTOON allows deliberate panel spacing to build psychological anticipation, challenging the assumption that all screen-based reading is inherently superficial or disengaged. However, these design benefits are conditional; features optimized for one device can feel awkward on another (for example, varying access to supplementary text in the webcomic xkcd across mobile and desktop interfaces). Thus, digital reading experiences depend on alignment among comic design, interface mechanics, and reader expectations, rather than on the digital delivery of text.

2.4. Comprehension and Processing Efficiency: Media vs. Format Dynamics

Positive reading experiences and high engagement should not be conflated with consistently superior reading comprehension. Kumar and Dhar (2024) compared digital and printed comics using a within-subject think-aloud study with 15 high-school students. They reported a statistically significant advantage for print in reading time, slower gaze-switching between areas of interest on desktop screens, and a higher frequency of reported word repetition in screen conditions. These findings suggest that screen-based comic presentations can introduce cognitive processing or navigational difficulties under specific reading conditions. Because reader effort and cognitive ease directly shape a user's willingness to sustain reading, these interface hurdles matter for habit formation. However, the small convenience sample limits generalizability, and desktop-based comic reading cannot automatically capture the user experience of smartphone-native vertical webcomics or tablet-based guided viewing (Kumar & Dhar, 2024).

Rasamimanana et al. (2025) provided a complementary perspective; they conducted an eye-tracking experiment with 40 skilled adult readers comparing comic and prose narrative formats presented on screens. While overall reading comprehension scores did not differ significantly between formats, participants explored the comic format significantly faster, and target words in speech balloons were processed faster than equivalent words in prose versions. The authors interpreted these eye-movement patterns as evidence that integrated visual illustrations assist readers in constructing an initial mental model of the narrative, which accelerates verbal text processing.

Rasamimanana et al. (2025) compared narrative formats (comics vs. prose) on a screen, whereas Kumar and Dhar (2024) evaluated delivery media (screen vs. print) for comics. Far from being contradictory, these studies collectively demonstrate why media scholars must carefully isolate the effects of a comic's visual-verbal structural format from the technical effects of the physical device and user interface through which it is read.

2. 5. Gap of the study

Recent scholarship in digital media highlights a critical tension between short-form distraction and long-form digital immersion. Despite these insights into cognitive distraction and digital reading mechanics, a significant research gap remains at their intersection: existing literature rarely examines how the haptic muscle memory and rapid visual habits cultivated by short-form video culture are repurposed by readers to sustain long-form literary focus. This study bridges this gap by analyzing how audiences transition from passive, algorithmic scrolling to active, sustained reading in vertical digital comic environments.

3. Objectives of the Study

Building directly upon the identified literature gap, this study aims to systematically analyze the cognitive and haptic bridge between algorithmic micro-content feeds and serialized vertical reading. Specifically, the research seeks to fulfill three key objectives :

- Identify Spatial and Kinetic Parallels: Determine how interface architectures (such as negative gutter space, infinite canvas layouts, and vertical swiping) align with user muscle memory formed on short-form video platforms.
- Analyze Attention Modulation: Examine how narrative hook mechanics and visual-verbal pacing in vertical webcomics convert rapid scanning behavior into sustained reading endurance.
- Evaluate Reader Agency: Explore the transition from passive, algorithmically driven video delivery to active, user-paced haptic reading control.

4. Research Questions

To achieve these objectives, the study addresses the following central research questions:

- How do the visual and spatial structures of vertical digital comics adapt or repurpose the kinetic scrolling habits established by short-form video feeds?
- In what ways do haptic interface mechanics (e.g., thumb-pacing, variable scroll speeds) enable readers to overcome digital fatigue and maintain sustained focus across serialized narrative arcs?

5. Methodology

To address these questions, this study employs a hybrid qualitative research design combining multimodal text analysis with user experience (UX) structural mapping:

- Corpus Selection: A curated sample of highly engaging vertical digital comic episodes (retrieved from major platforms such as Webtoon and Kakao Page) exhibiting high reader retention metrics and serialized cliffhanger structures.
- Multimodal Analysis: Application of visual social semiotics and comic theory (adapting frameworks from McCloud and Bateman) to code panel frequency, vertical gutter spacing, embedded audio triggers, and narrative temporal beats.
- Haptic & Interface Mapping: Comparative structural mapping analyzing the physical interaction metrics (scroll velocity, pause-points, and re-scrolling gestures) required by vertical comic layouts versus continuous automated short-form video feeds.

6. Discussion

As digital interfaces increasingly reshape contemporary reading practices, the transition from algorithmic social media consumption to mobile-first narrative engagement highlights a pivotal shift in screen-based literacy. Rather than viewing mobile scrolling as an inherent driver of cognitive fragmentation, this study demonstrates how vertical digital comic platforms established haptic habits to foster deep, sustained literary immersion. The following discussion analyzes this transformation across four interconnected dimensions. First, it explores the "kinetic bridge" through which social media motor habits are redirected into ergodic reading tools. Second, it contrasts the passive working-memory overload of algorithmic video feeds with the active cognitive pacing inherent in webtoon reading. Third, it examines how scroll-based vertical architectures manipulate spatial negative space to encode temporal rhythm and regulate reader attention. Finally, it evaluates the intersection of platform economics and serialized narrative structures, illustrating how monetized delivery models channel short-form reading habits into long-term serial commitment. Together, these sections explore how mobile-native media can convert the mechanics of distraction into instruments of active narrative focus.

6. 1. The Kinetic Bridge: Repurposing Social Media Muscle Memory

The physical gesture of vertical scrolling, initially trained and normalized by short-form video platforms (e.g., TikTok, Instagram Reels), serves as the foundational haptic entry point for contemporary digital comics reading. Industry platform data indicates that modern mobile comic consumers frequently transition directly from social media browsing to serialized comic environments like WEBTOON, Tappytoon, and GlobalComix. Rather than treating the thumb-driven swipe as an instrument of permanent distraction, platforms utilizing the vertical "infinite canvas" harness this exact motor habit to guide readers into long-form serial narratives. As Benatti (2024) notes, born-digital formats leverage digital-native structures that remove traditional print constraints, allowing the physical kinetic motion of scrolling to become the primary vehicle for narrative progression.

To understand this transition theoretically, one must examine the concept of ergodic literature (Aarseth, 1997)—texts where non-trivial physical effort is required for the reader to traverse the narrative space. In traditional print graphic novels, historical analyses demonstrate how comic narratives relied on rigid multi-panel grids and page turns to structure narrative flow (Cho, 2016). However, as digital comics evolved from traditional page layouts into single vertical strips designed specifically for smartphone interaction, the act of thumb-scrolling down the screen replaced manual page-turning altogether (Cho, 2016).

This structural evolution creates a seamless kinetic bridge: the motor skill learned in algorithmic video feeds (the upward thumb-swipe) is repurposed as an ergodic tool for literary progression. Users must adopt a foreign physical interface in long-form storytelling. Mobile-first comic platforms utilize their haptic continuity. The user retains the physical familiarity of the social media interface while the cognitive outcome shifts radically from micro-content scanning to sequential narrative immersion.

6.2. From Digital Overstimulation to Balanced Cognitive Engagement

The cognitive implications of continuous scrolling depend heavily on whether the digital interface is passively automated or actively controlled by the reader. Empirical research on short-form video platforms shows that high-frequency algorithmic scrolling triggers a state of "scroll immersion," which directly correlates with working memory deficits and heightened mental fatigue (Alruwaili, 2025). This aligns with neurocognitive data showing that active social media scrolling sessions disrupt executive brain functions and temporarily reduce immediate recall capacity compared to baseline tasks (Al-Ghamdi et al., 2024). Furthermore, behavioral studies show that algorithmic micro-video feeds encourage compulsive continuous watching, distorting users' perception of time and fostering attentional fragmentation (Zhang et al., 2024). In these automated feeds, users operate primarily within a reactive cognitive loop: the system determines the sequence, duration, and transition of stimuli, leaving the viewer's working memory vulnerable to continuous, unparsed cognitive overload.

In stark contrast, vertical digital comics alter this attentional dynamic by introducing active cognitive pacing (Kim, 2022). While short-form video feeds automate content delivery and overwhelm working memory through rapid audiovisual cuts, reading webtoons on smartphones requires the human brain to actively integrate text and visual imagery while dynamically adjusting scroll velocity (Kim, 2022). The physical screen layout no longer dictates an automated temporal flow; instead, the reader leverages haptic touch to control reading speed, pause at critical narrative junctures, or re-scroll to re-examine previous panel arrangements. This fundamental shift returns cognitive agency to the user, allowing executive functions to regulate multimodal information rather than being overwhelmed by continuous algorithmic streams.

Unlike the passive consumption in algorithmic feeds, vertical graphic narratives force the reader's brain to modulate attention through deliberate visual decoding. Deciphering sequential visual panels alongside embedded textual dialogue demands higher-order cognitive coordination, requiring the reader to construct coherent mental models across vertical space. The reader thus transitions from a passive recipient of high-speed video loops to an active manager of narrative pacing, transforming an interface originally built for distraction into a venue for sustained executive focus. By repurposing the thumb's kinetic motion into an instrument of self-regulated reading velocity, digital comic platforms demonstrate that screen-based scrolling can support deep narrative engagement rather than visual fatigue.

6. 3. Scroll-Based Architecture and Narrative Structure

The unique spatial vertical layout architecture transforms fragmented distraction into sustained reading. In modern webtoon platforms, creators manipulate the blank negative space (gutters) between panels to establish a specialized visual grammar of scrolling (Jang & Park, 2021). Rather than treating screen boundaries as static containers, born-digital comic environments format narrative progression along a singular, uninterrupted vertical axis. This layout shift redefines how digital mobile interfaces encode narrative time and spatial relationships.

In traditional print comics, temporal progression is by panel arrangement and gutter gaps across static pages. In vertical digital formats, however, artists stretch or compress vertical white space to dictate the speed at which the reader swipes down the screen, effectively replacing cinematic camera cuts with scrolling time intervals (Jang & Park, 2021). In print graphic novels, the reader's gaze jumps across two-dimensional grid layouts, where physical page turns mark major narrative transitions. In contrast, the infinite vertical canvas converts temporal duration into physical distance. Expanding the vertical space between panels creates a spatial delay that dictates how long a reader must scroll before reaching the next visual beat, granting creators precise control over temporal rhythm within a mobile interface. (See Table 1)

Short-form video feed	Vertical digital comic feed
Automated digital delivery	User-controlled haptic velocity
Passive reader engagement	Active reader engagement
Memory deficits and fatigue	Spatial & visual pacing
Fragmented attention	Sustained narrative focus

This table compares the two digital formats of content organization, scrolling mechanisms, visual presentation, and reader engagement.

This spatial manipulation creates a controlled visual rhythm. When a webtoon creator expands the vertical distance between panels, the reader continues longer physical scroll gestures across more space, creating space, generating structural pauses, and building narrative suspense. Conversely, tightly stacked panels accelerate reading velocity to convey rapid action or simultaneous events. By controlling the temporal interval through vertical expansion, the interface counteracts the frantic, high-speed visual scanning learned from social media feeds. The negative space acts as a cognitive buffer, encouraging micro-pauses. These micro-pauses help working memory consolidate narrative information before the visual beat is revealed. Consequently, spatial design and vertical architecture transform the physical swipe from an engine of mindless browsing into an active, rhythm-regulating reading practice.

6. 4. Platform Economics and Serialized Narrative Immersion

Transformation of narrative attention is also tied to platform capitalism and serialized publishing models. García-Cruz (2026) conceptualizes modern digital comic chapters as Minimum Viable Stories (MVS)—concise, self-contained narrative units optimized for immediate mobile engagement within platform ecosystems. Platforms like WEBTOON and Tappytoon deploy these bite-sized serialized chapters alongside cliffhangers and micro-transaction release schedules (Fast Pass models) to capture short-form attention spans and gradually channel them into long-term serial reading. By monetizing early access to upcoming episodes, platform architectures align financial incentives with narrative tension, encouraging readers to invest repeatedly in ongoing plotlines.

Whereas continuous short-form video watching induces addictive, unstructured swiping cycles that exhaust cognitive capacity (Zhang et al., 2024), serialized digital comics provide structured narrative endpoints. In short-video feeds, the lack of defined boundaries leads to perpetual micro-stimulations that erode executive focus over time. In contrast, each vertical comic episode delivers a satisfying micro-arc while embedding broader serial hooks that motivate readers to return weekly or binge multi-chapter arcs. The episode conclusions give readers natural cognitive resting points, transforming continuous scrolling into intentional, goal-directed reading sessions rather than endless algorithmic drift.

Consequently, the vertical scroll format serves as a bridge: it meets mobile users within their established kinetic habits (short, mobile-native reading sessions) while offering a structured framework that fosters deep, multi-year literary commitment to complex fictional worlds. By harmonizing the bite-sized delivery of social media consumers with the deep narrative layering of traditional serial fiction, modern digital comic platforms show how platform economics can drive sustained literacy rather than superficial consumption.

7. Conclusion

This study addresses a foundational gap in contemporary digital media scholarship by examining how kinetic muscle memory, haptic defaults, and rapid visual habits cultivated within short-form video culture are repurposed to foster sustained reading in vertical digital comics. By analyzing mobile-first publishing ecosystems—such as WEBTOON, Tappytoon, and GlobalComix—through a hybrid qualitative framework of visual social semiotics, ergodic theory, and user experience structural mapping, this research demonstrates the structural mechanisms driving the transformation of narrative attention. Findings confirm that screen-based scrolling is not inherently antithetical to long-form immersion; rather, when embedded within an intentional vertical layout, physical scrolling evolves from an engine of algorithmic distraction into an active instrument of cognitive pacing, ergodic agency, and deep literary focus.

In direct response to the first central research question regarding spatial and visual adaptation, the findings reveal that vertical digital comics do not reject short-form scrolling habits; instead, they rely on a structural model of haptic continuity. Platforms optimize narrative delivery along an infinite vertical canvas that seamlessly adopts the single-hand upward thumb gesture normalized by social media feeds. However, spatial architecture fundamentally transforms this kinetic habit through the deliberate deployment of negative vertical space (gutters) and serialized Minimum Viable Story (MVS) units. By stretching white space between panels, creators convert spatial distance into physical scrolling time intervals, effectively replacing traditional print page turns and cinematic cuts. Expanding vertical distances forces readers to scroll through space, inserting natural micro-pauses that regulate reading velocity, build dramatic suspense, and counteract high-speed visual scanning. By structuring complex narrative epics into mobile-native, serialized chapters with defined episode endpoints, platforms bridge short-form attention spans with long-term, multi-chapter serial commitment.

Addressing the second research question concerning digital fatigue and attentional focus, the study demonstrates how haptic interface mechanics actively restructure the user's cognitive state. Whereas automated algorithmic video feeds induce passive scroll immersion, working memory deficits, and executive function impairment through continuous audiovisual overload, vertical digital comics restore active ergodic agency to the reader. Haptic mechanics encourage users to adjust scroll velocity, pause at high-impact panels, or re-scroll to re-examine spatial-verbal interactions across the vertical axis. This active haptic control transforms the reader from a passive recipient of rapid video loops into an active manager of narrative pacing. By transferring executive agency to the user and offering structured narrative resting points at the conclusion of each episode, vertical comic interfaces relieve cognitive strain, buffer against digital fatigue, and convert erratic scrolling into sustained, goal-directed narrative focus.

These structural and cognitive dimensions prove that the shift from scrolling to sustained reading represents a fundamental transformation in cognitive engagement. While short-form video culture relies on automated algorithmic push models that reveal micro-attentional hooks, cognitive overload, and fragmented attention across fixed video frames, vertical digital comics utilize user-controlled haptic velocity to foster active ergodic agency. The transition replaces automated visual cuts with infinite canvas layouts, variable vertical gutters, and temporal spacing. Consequently, the users move away from perpetual, boundaryless micro-content streams toward structured, multi-chapter serials, effectively replacing cognitive strain with active text-image consolidation and sustained narrative focus.

This study reframes the broader critical debate surrounding social media, mobile interfaces, and contemporary literacy. Rather than viewing mobile scrolling as a unilateral force of cognitive destruction, the research proves that interface design and narrative architecture dictate cognitive outcomes. When platforms replace automated algorithmic push models with user-controlled ergodic mechanics, the very motor skills learned in short-form video culture can serve as a powerful cognitive bridge to deep, long-form reading. Future research should build upon these qualitative and structural findings by incorporating empirical eye-tracking and biometric scroll-velocity measurements across diverse reader demographics to further map real-time cognitive consolidation during vertical reading sessions.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

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Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers.

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