**Background Study**

In the contemporary digital landscape, short-form video content has fundamentally reshaped media consumption patterns among young adults worldwide. Platforms such as TikTok, Instagram Reels, and YouTube Shorts deliver algorithmically curated videos typically ranging from fifteen seconds to one minute, characterized by rapid transitions, vivid visual stimuli, and sophisticated personalization mechanisms (Carrier et al., 2015; Wilmer et al., 2017). These platforms employ recommendation algorithms and infinite scroll interfaces that create compelling user experiences through dopamine-triggering reward mechanisms, conditioning users toward habitual, repetitive consumption patterns (Montag et al., 2019). The proliferation of short-video consumption intensified substantially during the COVID-19 pandemic as students increasingly turned to mobile platforms for recreation, social connection, and psychological relief (Carrier et al., 2015). While short-form videos offer potential benefits including creative expression and micro-learning opportunities, their pervasive consumption has raised significant concerns regarding detrimental effects on cognitive functions essential for academic learning and intellectual development. The cognitive implications are particularly concerning given the fundamental role of core cognitive processes in academic success. Working memory, which temporarily holds and manipulates information during complex tasks, operates with limited capacity and can become overwhelmed when confronted with excessive information loads (Baddeley, 2000). According to Baddeley's multi-component model, working memory comprises the phonological loop for verbal information, visuospatial sketchpad for visual content, episodic buffer for integrating information, and central executive that coordinates attention. Short-form videos simultaneously engage multiple subsystems through rapid presentation of combined visual, auditory, and textual stimuli, potentially creating cognitive overload that impedes effective processing (Wilmer et al., 2017). Sweller's Cognitive Load Theory demonstrates that instructional materials must carefully balance intrinsic, extraneous, and germane cognitive load to optimize learning, yet the fragmented, entertainment-oriented design of short videos often imposes high extraneous cognitive load that interferes with deeper processing (Sweller, 1988). Furthermore, constant novelty-seeking behavior reinforced through dopamine-driven engagement may condition the brain to favor brief attention bursts over sustained concentration, potentially impairing capacity for tasks requiring prolonged focus and deep cognitive processing (Firth et al., 2020; Montag et al., 2019).

Memory retention, involving encoding, storage, and retrieval of information over time, represents another critical domain potentially affected by short-video consumption. The spacing effect demonstrates that distributed learning produces substantially superior long-term retention compared to massed practice (Cepeda et al., 2006). However, continuous scrolling behavior contradicts optimal spacing principles by encouraging rapid, sequential consumption without adequate processing intervals, potentially undermining memory consolidation processes. The levels of processing framework posits that memory durability depends critically on processing depth, with shallow processing producing weaker memory traces than deep processing involving semantic analysis (Craik & Lockhart, 1972). Short-video consumption, particularly when driven by entertainment-seeking motivations, may promote predominantly shallow processing as users quickly scan content without sustained engagement or deliberate efforts to connect new information with prior knowledge. Research by Otto (2025) reveals that learning with short videos promotes surface learning approaches and results in lower assessment performance compared to text-based learning, suggesting the format itself may encourage less effective cognitive processing strategies.

Reading comprehension, defined as the active process of understanding and interpreting written text through strategic interaction between reader, text, and prior knowledge, constitutes an essential academic skill increasingly challenged by digital media consumption. Although short videos are primarily audiovisual, many incorporate text overlays, captions, and supplementary written content requiring comprehension abilities. Bartlett's schema theory (1932) indicates that comprehension involves active reconstruction wherein readers utilize existing knowledge structures to interpret new information. However, Mayer's Cognitive Theory of Multimedia Learning (2009) indicates that effective text-visual integration requires careful attention to cognitive processing principles, and the rapid pace combined with competing attentional demands may disrupt necessary cognitive processes. The split-attention effect, wherein learners must mentally integrate separated information sources, becomes particularly problematic when cognitive resources are depleted, substantially increasing extraneous cognitive load and reducing comprehension (Ayres & Sweller, 2014). Furthermore, rapid-fire presentation and entertainment-driven design may reduce focus stamina as frequent exposure to brief, high-stimulation content conditions cognitive systems to expect constant novelty rather than sustained engagement (Firth et al., 2020).

Decision-making, conceptualized as the cognitive process of selecting actions from available alternatives based on evaluation criteria, represents a fourth critical domain potentially compromised by excessive short-video consumption. Simon's influential model (1947) describes this process as involving intelligence (problem identification), design (alternative generation and evaluation), and choice (selection of satisfactory solutions), with each stage requiring cognitive resources and deliberate consideration. However, pervasive short-video consumption appears to foster cognitive patterns characterized by impulsivity and reduced tolerance for deliberate thought. The rapid, dopamine-driven feedback loops create neurological adaptations that prioritize immediate rewards, potentially undermining executive functions that support effective decision-making (Montag et al., 2019). The Elaboration Likelihood Model distinguishes between central route processing involving careful evaluation and peripheral route processing relying on superficial cues (Petty & Cacioppo, 1986). Habitual short-video consumption may shift users toward peripheral routes, as platforms reward quick judgments based on immediate emotional responses rather than thorough analysis (Pennycook & Rand, 2019).

Beyond direct effects, privacy and security concerns introduce additional complexity as moderating factors. Privacy concerns about data collection, algorithmic tracking, and behavioral profiling require ongoing cognitive resources for monitoring and management (Dinev & Hart, 2006). Research demonstrates that heightened privacy awareness leads to increased cognitive vigilance, paradoxically reducing content engagement depth as users allocate mental resources to monitoring behavior rather than processing content (Baruh et al., 2017). These concerns function as persistent cognitive distractors requiring directed attention to suppress, creating continuous partial attention states that undermine cognitive performance (Kaplan, 1995). Similarly, security considerations regarding misinformation and manipulated content significantly impact information processing and decision-making. Research reveals that rapid content consumption reduces analytical thinking and increases reliance on intuitive judgments, making users more susceptible to deceptive content (Pennycook & Rand, 2019).

In Sri Lanka, these concerns have acquired particular urgency with social media penetration exceeding 50% of the population and approximately 8.2 million active users, predominantly aged 18-24, corresponding to the undergraduate demographic (DataReportal, 2025). Despite evident relevance and growing prevalence among Sri Lankan state university students, empirical research examining specific impacts on working memory, memory retention, reading comprehension, and decision-making capabilities remains notably scarce within this context. Existing literature has predominantly emerged from Western and East Asian contexts where educational infrastructures, student demographics, cultural norms, and academic expectations may differ substantially from South Asian developing nation contexts. This geographical concentration creates a critical knowledge gap, as findings from high-income countries cannot be directly extrapolated to populations operating within markedly different socio-technical environments. Furthermore, no known studies have systematically examined how privacy and security concerns moderate relationships between short-video consumption and multiple cognitive outcomes simultaneously among undergraduate populations in developing countries. Understanding how short-video consumption affects cognitive functions within this specific context, and how privacy and security concerns modulate these relationships, is essential for developing culturally appropriate, contextually grounded theoretical frameworks and evidence-based interventions that can meaningfully support cognitive development and academic success of Sri Lankan undergraduate students navigating increasingly digital educational landscapes.

**Problem Statement**

The pervasive consumption of short-form video content among undergraduate students in Sri Lankan state universities has emerged as a critical concern with significant implications for cognitive functioning and academic performance. Despite the rapid proliferation of platforms such as TikTok, Instagram Reels, and YouTube Shorts—with over 8.2 million active social media users in Sri Lanka, predominantly aged 18-24, and TikTok alone claiming over 5.7 million adult users (DataReportal, 2025)—there exists a substantial knowledge gap regarding how this consumption pattern systematically affects essential cognitive functions necessary for academic success. Specifically, the extent to which habitual short-video consumption influences working memory capacity, memory retention processes, reading comprehension abilities, and decision-making capabilities among Sri Lankan undergraduates remains largely unexplored.

This problem is particularly significant because these four cognitive domains constitute foundational pillars of academic learning and scholarly achievement. Working memory serves as the cognitive workspace where information is temporarily held and actively manipulated during complex tasks (Baddeley, 2000). When compromised through cognitive overload or continuous task-switching triggered by excessive short-video consumption, students' capacity to process lectures, understand complex concepts, and engage in higher-order thinking becomes substantially impaired. Memory retention, encompassing encoding, storage, and retrieval of information, determines whether students can successfully consolidate new knowledge and recall previously learned material (Cepeda et al., 2006; Craik & Lockhart, 1972). If short-video consumption disrupts memory consolidation through interference effects or promotion of shallow processing, the academic consequences could prove severe. Reading comprehension, involving active interpretation and understanding of written texts, remains essential for engaging with academic literature (Bartlett, 1932). Should short-video consumption reduce sustained attention capacity or promote surface-level processing habits, students' ability to comprehend academic texts would be fundamentally undermined (Otto, 2025). Finally, decision-making processes prove critical for academic choices including time management and study strategy selection (Simon, 1947). If dopamine-driven reward-seeking patterns reinforced by short-video platforms shift students toward impulsive judgments rather than deliberate thinking, their capacity for sound decisions may be seriously compromised (Montag et al., 2019; Pennycook & Rand, 2019).

Compounding this problem, the majority of empirical research examining short-form video consumption and cognitive outcomes has been conducted within Western and East Asian contexts, creating a critical gap in contextually grounded understanding. Sri Lankan state university students navigate distinctive circumstances including considerable academic pressure, inconsistent internet connectivity, varying digital literacy levels, and cultural frameworks that may shape technology adoption patterns differently than populations studied in high-income countries. The direct extrapolation of findings from Western contexts to Sri Lankan student populations remains methodologically questionable, as educational infrastructures, student demographics, and cultural norms differ substantially. Without empirical evidence generated specifically within the Sri Lankan state university context, educational stakeholders lack the foundation necessary for understanding the actual scope and nature of cognitive impacts experienced by their student populations.

Furthermore, an additional critical dimension involves the moderating role of privacy and security concerns in the relationship between short-video consumption and cognitive outcomes. Privacy concerns—encompassing anxieties about data collection practices, algorithmic tracking, behavioral profiling, and potential misuse of personal information—demand ongoing cognitive resources for monitoring and management (Dinev & Hart, 2006). Research indicates that heightened privacy awareness leads to increased cognitive vigilance, which paradoxically reduces content engagement depth as users allocate mental resources to monitoring behavior rather than fully processing informational content (Baruh et al., 2017). These privacy concerns function as persistent cognitive distractors requiring directed attention to suppress, creating continuous partial attention states that may exacerbate negative cognitive impacts by further depleting limited cognitive resources (Kaplan, 1995). Similarly, security considerations—including concerns about misinformation, deepfakes, and manipulated content—significantly influence how users cognitively process information and make decisions during platform engagement. When security threats become salient, users may adopt defensive processing strategies characterized by heightened skepticism, yet paradoxically, this defensive posture may reduce their ability to accurately discriminate between credible and non-credible information sources, thereby affecting decision quality and critical evaluation capabilities (Pennycook & Rand, 2019; Petty & Cacioppo, 1986). However, no known studies have systematically examined how privacy and security concerns moderate the relationship between short-video consumption and multiple cognitive outcomes simultaneously, despite the theoretical importance and practical relevance of these moderating factors.

The absence of empirical evidence addressing this problem creates substantial practical challenges for multiple stakeholder groups. University administrators and policymakers lack evidence-based foundations for developing institutional policies regarding digital media use or implementing digital wellness programs. Educators struggle to understand observable changes in student behavior—including apparent declines in sustained attention during lectures, reduced comprehension of complex materials, increased academic procrastination, and impaired critical thinking—without recognizing the potential contribution of short-video consumption patterns. Students themselves remain largely unaware of how their media consumption habits may be systematically undermining their cognitive capacities and academic performance, lacking both knowledge about potential impacts and practical strategies for maintaining healthy digital consumption patterns.

**Therefore, the central research problem is: There exists insufficient empirical evidence regarding how short-form video consumption affects the cognitive functions—specifically working memory, memory retention, reading comprehension, and decision-making—of undergraduate students in Sri Lankan state universities, and whether privacy and security concerns moderate these relationships.** Addressing this research problem through systematic empirical investigation is essential for developing theoretically grounded, contextually appropriate understanding that can inform evidence-based interventions, guide institutional policy development, support effective educational practices, and ultimately promote the cognitive health and academic success of Sri Lankan undergraduate students navigating increasingly digital educational and social landscapes.

# Literature Review

## Introduction

The exponential growth of short-form video platforms has fundamentally transformed digital media consumption patterns, particularly among young adults and university students. This literature review examines the theoretical foundations and empirical evidence regarding how short-form video consumption affects cognitive functions, with specific emphasis on working memory, memory retention, reading comprehension, and decision-making. Additionally, this review explores the moderating role of privacy and security concerns in these relationships, synthesizing current knowledge while identifying gaps that justify the present investigation within the Sri Lankan state university context.

## Theoretical Frameworks

### Cognitive Load Theory and Working Memory

Cognitive Load Theory, proposed by Sweller (1988), provides a foundational framework for understanding how multimedia content affects learning and cognitive processing. The theory distinguishes between three types of cognitive load: intrinsic load (inherent complexity of the material), extraneous load (unnecessary cognitive processing imposed by poor instructional design), and germane load (cognitive effort dedicated to meaningful learning). Sweller (1988) argues that working memory has strictly limited capacity, and instructional materials must be carefully designed to avoid overwhelming these cognitive resources. Short-form videos, with their rapid scene changes, simultaneous audio-visual stimulation, and text overlays, potentially impose high extraneous cognitive load that interferes with effective information processing and retention.

Baddeley's (2000) multi-component model of working memory elaborates on this limited capacity system, identifying distinct subsystems that process different types of information. The model comprises the phonological loop for processing verbal and auditory information, the visuospatial sketchpad for managing visual and spatial content, the episodic buffer that integrates information from multiple sources and links with long-term memory, and the central executive that coordinates attention and controls information flow between subsystems. Short-form videos simultaneously engage multiple components through rapid presentation of combined visual, auditory, and textual stimuli, potentially creating cognitive overload that impedes effective processing (Baddeley, 2000). This theoretical framework suggests that the design characteristics of short-video platforms may fundamentally conflict with optimal conditions for working memory function.

Empirical support for these theoretical concerns emerges from research examining smartphone and digital media use. Wilmer et al. (2017) conducted a comprehensive review exploring links between mobile technology habits and cognitive functioning, finding consistent evidence that frequent media multitasking and smartphone use correlate with reduced cognitive control, attention capacity, and working memory performance. The fragmented nature of short-video consumption, characterized by rapid switching between numerous brief videos, exemplifies the type of media multitasking that Wilmer et al. (2017) identify as cognitively detrimental. Similarly, research by Ophir et al. (2009) demonstrates that individuals who frequently engage in media multitasking show reduced performance on task-switching and filtering irrelevant information, suggesting that habitual short-video consumption may train cognitive systems in ways that undermine rather than enhance cognitive capabilities.

### Memory Retention: Spacing Effects and Levels of Processing

Memory retention research provides two foundational theoretical frameworks relevant to understanding short-video consumption effects. The spacing effect, extensively documented by Cepeda et al. (2006) through meta-analytic review of verbal recall tasks, demonstrates that distributed practice—learning episodes separated by temporal intervals—produces substantially superior long-term retention compared to massed practice where learning occurs in condensed time periods. Cepeda et al. (2006) found robust spacing effects across diverse materials, retention intervals, and participant populations, establishing this as one of psychology's most reliable phenomena. However, the continuous scrolling behavior characteristic of short-video platforms directly contradicts optimal spacing principles by encouraging rapid, sequential consumption of numerous brief videos without adequate processing intervals between distinct content items. This structural feature of short-video platforms potentially undermines the memory consolidation processes that require time for neural stabilization and integration with existing knowledge structures.

Complementing the spacing effect literature, the levels of processing framework proposed by Craik and Lockhart (1972) provides crucial insights into factors determining memory durability. This framework posits that memory retention depends critically on processing depth, with shallow processing focused on surface features (such as visual appearance or sound) producing weaker, more transient memory traces than deep processing involving semantic analysis, meaningful elaboration, and connection with prior knowledge. Craik and Lockhart (1972) argue that activities promoting deep processing—such as generating meaningful associations, relating new information to personal experience, or explaining concepts in one's own words—produce substantially more durable memories than passive, surface-level exposure. Short-video consumption, particularly when driven by entertainment-seeking motivations rather than learning intentions, may promote predominantly shallow processing as users quickly scan content without sustained engagement, comprehensive analysis, or deliberate efforts to connect new information with prior knowledge.

Recent empirical research supports these theoretical concerns. Otto (2025) conducted a comparative analysis examining the impact of short videos on rational thinking and learning, revealing that participants who learned with short videos scored significantly lower on subsequent assessments compared to those who learned with text-based materials. Critically, Otto (2025) found that watching short video collections led to higher situational surface learning approaches, suggesting that the format itself encourages less effective cognitive processing strategies. These findings indicate that short-form video consumption may fundamentally alter how students approach learning tasks, promoting quick, superficial engagement rather than the deep, effortful processing necessary for robust memory formation and knowledge retention.

### Reading Comprehension: Schema Theory and Multimedia Learning

Reading comprehension research provides essential theoretical foundations for understanding how short-video consumption might affect text processing abilities. Bartlett's (1932) schema theory revolutionized comprehension research by proposing that understanding involves active reconstruction rather than passive reception. According to this theory, readers utilize existing knowledge structures (schemas) to interpret and make sense of new textual information, with comprehension fundamentally depending on the interaction between text content and reader's prior knowledge. Bartlett (1932) demonstrated through experimental studies that memory for stories becomes progressively distorted in ways reflecting individuals' existing schemas, suggesting that comprehension is inherently constructive and interpretive rather than merely reproductive. This theoretical framework implies that effective reading comprehension requires sustained attention, active cognitive processing, and deliberate efforts to integrate new textual information with existing knowledge—cognitive activities that may be compromised by habitual short-video consumption patterns.

Mayer's (2009) Cognitive Theory of Multimedia Learning extends these insights to multimedia contexts, proposing principles for effective integration of text and visual information. Mayer (2009) argues that meaningful learning from multimedia requires learners to select relevant visual and verbal information, organize this information into coherent mental representations, and integrate these representations with each other and with prior knowledge. The theory identifies several design principles that facilitate or hinder this process, including the spatial contiguity principle (placing related text and graphics near each other), temporal contiguity principle (presenting related information simultaneously rather than successively), and coherence principle (excluding extraneous material). However, many short-form videos violate these principles through rapid pacing, spatially dispersed information, and inclusion of entertainment-oriented elements that increase extraneous cognitive load.

The split-attention effect, documented extensively by Ayres and Sweller (2014), represents a particularly relevant phenomenon. This effect occurs when learners must mentally integrate spatially or temporally separated information sources, substantially increasing cognitive load and reducing comprehension. Ayres and Sweller (2014) demonstrate that split attention imposes heavy demands on working memory, leaving fewer cognitive resources available for actual learning. When users simultaneously process dynamic video content, read rapidly changing text overlays, interpret social feedback indicators, and maintain awareness of platform interface elements, they experience severe split attention that compromises comprehension of individual content components. Furthermore, the rapid-fire presentation style and entertainment-driven design may reduce what researchers term "focus stamina"—the capacity to sustain attention on longer, more demanding texts—as frequent exposure to brief, high-stimulation content conditions cognitive systems to expect constant novelty and immediate rewards rather than patient, sustained engagement (Firth et al., 2020).

### Decision-Making: Dual-Process Theories and Elaboration Likelihood Model

Decision-making research provides crucial theoretical frameworks for understanding how short-video consumption might affect judgment and choice. Simon's (1947) influential model conceptualizes decision-making as a multi-stage process involving intelligence (identifying problems or opportunities requiring decisions), design (generating and evaluating alternative courses of action), and choice (selecting a satisfactory solution from available alternatives). Simon (1947) introduced the concept of "bounded rationality," arguing that human decision-makers operate under cognitive limitations that prevent truly optimal decision-making, instead pursuing "satisficing"—selecting the first alternative that meets minimum acceptability criteria. This framework suggests that factors further constraining cognitive resources, such as the attentional fragmentation and cognitive depletion associated with excessive short-video consumption, may push decision-makers toward even more limited, heuristic-based judgments.

The Elaboration Likelihood Model (ELM), proposed by Petty and Cacioppo (1986), provides additional theoretical insights by distinguishing between two routes to persuasion and decision-making. The central route involves careful, systematic evaluation of information based on relevant arguments and evidence, requiring substantial cognitive effort and motivation. In contrast, the peripheral route relies on superficial cues such as source attractiveness, social proof indicators, emotional appeals, or other heuristics that allow quick judgments without deep processing. Petty and Cacioppo (1986) argue that individuals engage in central route processing when both motivation and cognitive capacity are sufficient, but default to peripheral processing when either factor is limited. Habitual short-video consumption may shift users' default processing mode toward peripheral routes, as the platform environment rewards quick judgments based on immediate emotional responses, social proof indicators (likes, shares, comments), and attention-grabbing elements rather than thorough analysis and critical evaluation.

Complementing the ELM, the Cognitive-Experiential Self-Theory (CEST) proposed by Epstein (1994) offers a dual-process framework distinguishing between rational and experiential cognitive systems. The rational system operates consciously, analytically, and relatively slowly, processing information logically and deliberately. In contrast, the experiential system operates automatically, holistically, and rapidly, processing information based on emotions, associations, and past experiences. Epstein (1994) argues that both systems continuously operate in parallel, with their relative influence depending on situational factors and individual differences. Short-video platforms, with their emphasis on emotional engagement, rapid content delivery, and immediate gratification, may disproportionately activate and reinforce the experiential system while providing limited opportunity for rational system engagement.

Recent empirical research supports these theoretical concerns. Pennycook and Rand (2019) investigated susceptibility to partisan fake news, finding that belief in misinformation results primarily from lack of reasoning rather than motivated reasoning. Their research reveals that rapid content consumption—the defining characteristic of short-video platforms—reduces analytical thinking and increases reliance on intuitive, automatic judgments. Pennycook and Rand (2019) demonstrate that even simple interventions prompting analytical thinking can reduce belief in false information, suggesting that the cognitive mode activated during information consumption critically determines judgment quality. When users engage with short-video content in rapid succession without pauses for reflection, they likely remain in intuitive, experiential processing modes that increase vulnerability to misinformation and decrease quality of consequential decisions.

## Dopamine-Driven Engagement and Neurological Adaptation

Beyond specific cognitive domains, research on reward systems and neurological adaptation provides crucial insights into how short-video platforms may fundamentally alter cognitive functioning. Montag et al. (2019) examined addictive features of social media platforms and freemium games, analyzing how design elements exploit psychological and economic principles to maximize engagement. Their research identifies specific features—including variable reward schedules, social feedback mechanisms, infinite scroll interfaces, and personalized content recommendations—that trigger dopamine release and create habitual usage patterns. Montag et al. (2019) argue that these features function similarly to gambling mechanisms, creating psychological dependencies that drive compulsive use despite negative consequences.

The neurological implications of dopamine-driven engagement prove particularly concerning for student populations. Research by Firth et al. (2020) exploring the impact of internet use on memory and attention processes reveals that prolonged exposure to highly engaging digital content can alter neural structures and functions associated with cognitive control. Firth et al. (2020) found evidence that excessive internet use correlates with changes in prefrontal cortex functioning—the brain region responsible for executive functions including planning, impulse control, and decision-making. These neurological adaptations may explain behavioral patterns observed among heavy short-video consumers, including difficulty sustaining attention on less stimulating materials, increased impulsivity, and preference for immediate gratification over delayed rewards.

Paltaratskaya (2023) provides additional insights through doctoral research examining cognitive load during use of short-form video applications. This research reveals that the rapid, algorithm-driven content delivery characteristic of platforms like TikTok creates unique temporal perception effects, with users frequently experiencing "time distortion" where intended brief viewing sessions extend to hours of continuous consumption. Paltaratskaya (2023) argues that the cognitive load imposed by processing continuous streams of novel content, combined with the reward anticipation generated by variable content quality, creates conditions that override normal self-regulatory mechanisms. This finding has direct implications for university students who may intend to use short-video platforms briefly for relaxation but find themselves unable to disengage, resulting in substantial displacement of study time and academic activities.

## Privacy and Security as Moderating Factors

### Privacy Concerns and Cognitive Processing

An emerging but understudied dimension involves how privacy and security concerns moderate the relationship between short-video consumption and cognitive outcomes. Privacy Calculus Theory, articulated by Dinev and Hart (2006), proposes that users continuously evaluate benefits of disclosure against privacy risks when engaging with digital platforms. This theory suggests that privacy concerns do not simply deter platform use, but rather create ongoing cognitive demands as users must simultaneously engage with content while monitoring their own behavior, managing privacy settings, and evaluating potential risks. Dinev and Hart (2006) developed an extended privacy calculus model demonstrating that these evaluative processes require cognitive resources that become unavailable for other tasks.

Empirical evidence supports the cognitive impact of privacy concerns. Baruh et al. (2017) conducted a comprehensive meta-analytical review of research on online privacy concerns and privacy management, synthesizing findings from multiple studies to identify consistent patterns. Their analysis reveals that heightened privacy awareness leads to increased cognitive vigilance—a state of heightened alertness and monitoring that, paradoxically, can reduce depth of content engagement. Baruh et al. (2017) found that when users are aware of data collection practices such as algorithmic tracking of viewing patterns, facial recognition, or behavioral profiling, they allocate cognitive resources to monitoring their own behavior rather than fully engaging with informational or educational content. This finding suggests that privacy concerns function as persistent cognitive distractors that compound the attentional demands already imposed by short-video content.

Attention Restoration Theory, proposed by Kaplan (1995), provides additional theoretical context for understanding privacy concerns as cognitive distractors. This theory distinguishes between involuntary attention (captured automatically by interesting stimuli) and directed attention (requiring conscious effort to maintain focus and inhibit distractions). Kaplan (1995) argues that directed attention becomes depleted when individuals must continuously inhibit distractions or override automatic responses, leading to attention fatigue characterized by reduced concentration, increased errors, and impaired performance. Privacy concerns require directed attention to suppress anxieties about data misuse, monitor platform behaviors, and maintain vigilance about information disclosure. This continuous demand for directed attention, combined with the already fragmented attentional patterns promoted by short-video consumption, may create severe attention depletion that undermines cognitive performance across multiple domains.

### Security Considerations and Information Processing

Security concerns represent a distinct but related moderating factor affecting how users process information from short-video platforms. The proliferation of misinformation, deepfakes, manipulated content, and deliberate deception on social media platforms has heightened users' awareness of potential security threats. Research examining the psychology of misinformation provides crucial insights into how these concerns affect cognitive processing. Pennycook and Rand (2019) found that analytical thinking serves as a key defense against misinformation, with individuals who engage in deliberative, systematic processing showing substantially greater ability to distinguish accurate from false information. However, the rapid content consumption characteristic of short-video platforms provides minimal opportunity for such analytical processing.

When security concerns become salient, users may adopt defensive processing strategies characterized by generalized skepticism and heightened scrutiny of information sources. However, research suggests this defensive posture may paradoxically reduce rather than enhance judgment quality. The Elaboration Likelihood Model framework (Petty & Cacioppo, 1986) indicates that when cognitive resources are limited, individuals rely more heavily on peripheral cues rather than systematic evaluation. Thus, security-conscious users viewing short videos in rapid succession may develop heuristic-based skepticism—using superficial indicators to judge credibility—rather than engaging in the deep, analytical evaluation necessary for accurate discrimination between credible and non-credible information.

The dual-process perspective offered by Cognitive-Experiential Self-Theory (Epstein, 1994) suggests additional complexity. Security concerns activate the rational system, prompting deliberative assessment of information credibility and potential threats. However, the engaging, emotionally stimulating nature of short videos simultaneously activates the experiential system, creating cognitive conflict between careful evaluation and immediate emotional responses. This conflict may impair decision quality, as users struggle to balance rapid content consumption with security vigilance, ultimately producing suboptimal outcomes on both dimensions.

## Contextual Considerations: Digital Media Use in Educational Settings

Research examining digital media use in educational contexts provides important insights into potential academic impacts. Hollis and Was (2016) investigated mind wandering, control failures, and social media distractions in online learning environments, finding that digital distractions result in more frequent instances of losing attentional control and mind-wandering, especially in settings demanding sustained attention. Their research demonstrates that even when students intend to focus on academic tasks, the presence of accessible digital distractions substantially undermines concentration and learning effectiveness. Hollis and Was (2016) found that students who frequently checked social media during online learning showed significantly lower comprehension and retention of course material, suggesting that the cognitive costs of task-switching and attentional fragmentation prove substantial even when distraction episodes are brief.

Research by Zsila and Reyes (2023) examining the pros and cons of social media impacts on mental health provides additional context. Their comprehensive review identifies numerous negative consequences of excessive social media use, including increased anxiety, reduced self-esteem, sleep disturbances, and academic procrastination. Zsila and Reyes (2023) note that while social media offers benefits for social connection and information access, these advantages can be outweighed by negative consequences when use becomes excessive or compulsive. For university students already experiencing substantial academic pressure, the additional psychological burdens imposed by problematic social media use may further compromise cognitive functioning and academic performance.

The relationship between social media use and academic outcomes has been examined across multiple contexts. Research consistently identifies negative correlations between time spent on social media platforms and academic achievement indicators including grade point average, study time, and course completion rates. However, these correlational findings leave open questions about causal mechanisms and moderating factors. The present research addressing cognitive functions as mediating variables between short-video consumption and academic outcomes represents an important contribution to understanding these mechanisms.

## Research Gaps and Sri Lankan Context

Despite growing research attention to digital media effects on cognition, several critical gaps remain. First, existing research has predominantly focused on Western, European, and East Asian populations, with minimal investigation within South Asian developing nation contexts. Educational infrastructures, student demographics, cultural norms surrounding technology use, patterns of internet access, and academic expectations differ substantially across these contexts, limiting the generalizability of existing findings. Sri Lankan state university students navigate distinctive circumstances including considerable academic pressure within competitive environments, inconsistent internet connectivity requiring strategic timing of online activities, limited institutional resources for digital literacy education, and cultural factors influencing technology adoption patterns.

Second, most research examining short-video consumption effects has focused on single cognitive dimensions or global measures of academic performance, without systematically investigating multiple specific cognitive functions simultaneously. Working memory, memory retention, reading comprehension, and decision-making represent distinct cognitive processes that may be differentially affected by short-video consumption, yet few studies examine these comprehensively within a single investigation. This gap limits theoretical understanding of mechanisms and prevents identification of which cognitive domains prove most vulnerable to negative effects.

Third, the moderating role of privacy and security concerns has received minimal empirical attention despite clear theoretical relevance. Existing privacy research has primarily examined privacy concerns as determinants of platform adoption and disclosure behaviors, rather than as moderating factors affecting cognitive outcomes during platform use. Similarly, security research has focused on identifying misinformation and developing detection tools, with limited investigation of how security concerns affect users' cognitive processing during actual consumption of potentially unreliable content. Understanding these moderating relationships proves essential for developing comprehensive theoretical models and effective interventions.

Fourth, the rapid evolution of short-video platforms outpaces research productivity, creating knowledge gaps about platform-specific effects and recent design innovations. TikTok, which has become the dominant short-video platform globally, launched internationally only in 2018, meaning much existing research on social media effects predates this platform's rise. Platform-specific design features including TikTok's particularly sophisticated recommendation algorithm, "For You" page interface, and duet/stitch collaborative features may create unique cognitive impacts not captured by research on earlier social media platforms.

Finally, individual differences in privacy sensitivity, security awareness, digital literacy, and self-regulatory capacity remain understudied as moderating variables. University student populations show substantial heterogeneity in these characteristics, yet most research treats students as homogeneous groups. Understanding which students prove most vulnerable to negative cognitive effects, and what protective factors mitigate these effects, would inform targeted intervention strategies.

## Conclusion

The literature review reveals substantial theoretical foundations and growing empirical evidence suggesting that short-form video consumption may negatively affect multiple cognitive functions essential for academic success. Cognitive Load Theory and working memory research indicate that short-videos impose high cognitive demands that may overwhelm limited processing capacity. Memory retention research on spacing effects and processing depth suggests that continuous scrolling behavior and entertainment-oriented consumption promote suboptimal conditions for learning and retention. Reading comprehension theories indicate that short-video consumption may reduce sustained attention capacity and promote shallow processing habits that undermine text comprehension. Decision-making frameworks suggest that dopamine-driven engagement patterns shift users toward impulsive, heuristic-based judgments rather than deliberative, analytical thinking. Furthermore, privacy and security concerns introduce additional cognitive demands that may moderate and potentially exacerbate these negative effects.

However, critical gaps remain, particularly regarding contextual applicability to South Asian developing nation settings, comprehensive examination of multiple cognitive domains simultaneously, systematic investigation of moderating factors, and understanding of individual differences in vulnerability and resilience. The present research addresses these gaps by providing the first comprehensive examination of how short-form video consumption affects working memory, memory retention, reading comprehension, and decision-making among Sri Lankan state university undergraduates, while accounting for privacy and security concerns as moderating variables. This investigation contributes to theoretical understanding of digital media effects on cognition while providing contextually grounded evidence to inform educational practice and policy within Sri Lankan higher education.