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Individual Agency in the Digital Age: Exploring Attention Stewardship, Privacy Literacy and Misinformation Susceptibility

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ABSTRACT

In an increasingly digital world, concerns about online privacy and the spread of misinformation have become central to public discourse. These challenges highlight the potential role of intentional attention management in shaping digital behaviors, such as enhancing privacy literacy and discerning misinformation. While much focus has been placed on the influence of technology companies and platform design, less is known about individual-agency, specifically how people manage their attention and engagement in digital spaces. This study explores whether a lack of attention stewardship, the ability to intentionally regulate focus and critically engage with digital content is linked to lower privacy literacy and increased susceptibility to misinformation. Rather than emphasizing external tools, the study focuses on the internal architecture of the individual's ability to recalibrate and respond naturally to evolving challenges. The study is grounded in the Cognitive Versatility Theory (CVT) conceptual framework with a mixed method design. Linear regression analysis revealed that attention stewardship significantly predicted both misinformation susceptibility ($R2 = .345$, $p < .001$) and privacy literacy ($R2 = .581$, $p < .001$). Qualitative findings further supported the hypothesis, with participants demonstrating low cognitive agency and limited activation of self-awareness, emotional regulation, interpersonal skills, and problem-solving in simulated digital dilemmas. This research investigates the relationship to advance conceptual understanding on personal digital habits that may shape or influence broader societal issues.

1. Introduction

Currently, research remains limited in explaining how intentional attention management also termed attention stewardship relates to digital privacy literacy or the ability to discern misinformation. Existing studies tend to focus on digital culture and external platform-driven dynamics when addressing privacy and misinformation (Caled & Silvia, 2022). As algorithmic

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systems increasingly compile behavioral patterns, scholars describe this trend as eroding personal autonomy and limiting individual choice. Focus on external systems can obscure the interpretation of individual agency, particularly the role that intentional attention management may play as a protective factor. Platforms are deliberately engineered to capture and monetize attention, often at the expense of well-being and critical thinking (Tsamados et al., 2022). While these design forces are powerful, individuals may not be entirely passive. Since 2016, scholarly interest in self-governance within digital environments has grown. Emerging perspectives argue that cultivating attention stewardship through practices such as critical ignoring can empower users to resist exploitative digital environments (Kozyreva et al., 2023).

This study is grounded in Cognitive Versatility Theory (CVT) and the ACIR model, which conceptualize cognitive adaptability as the ability to shift among analytical, creative, intuitive, and reflective modes of thinking. Within this framework, attention stewardship reflects cognitive versatility specifically, the deliberate use of reflective and analytical thinking to manage digital stimuli. This aligns with critical ignoring, which enables users to disengage from manipulative or irrelevant content. The present study examines attention stewardship independently in relation to two outcomes: misinformation susceptibility and digital privacy literacy. This study reframes the discourse toward internal cognitive strategies emphasizes user autonomy and resilience. Such strategies may reveal new pathways for strengthening privacy literacy and improving misinformation discernment.

1.1 Problem Statement

Despite growing concerns about online privacy and misinformation, little is known about individual intentional attention management influences on digital behaviors in these areas.

1.2 Research Questions

- Does attention stewardship influence individuals' susceptibility to digital misinformation?
- How is attention stewardship related to individuals' digital privacy literacy and the risk associated with digital platforms?
- What role do VP (psychological competencies) (self-awareness, emotion regulation, interpersonal skills, and problem-solving) play in moderating the effects of digital privacy literacy and misinformation?

2. Overview of Literature

2.1 Attention Stewardship

The rise of the attention economy has precipitated a crisis in which digital platforms and algorithms are deliberately designed to capture, commodify, and monetize user attention, often at the expense of cognitive agency (Baeza-Yates & Fayyad, 2021). These dynamics raise significant ethical concerns surrounding manipulation, consent, and the erosion of critical thinking. In response to this growing concern, the concept of attention stewardship could serve as a potential countermeasure. Attention stewardship refers to an individual's capacity to intentionally manage their cognitive focus in digital environments. This concept is closely aligned with theories of individual agency, particularly within psychological and behavioral sciences, where attention regulation and self-directed behavior are central themes. Karki (2024) emphasizes that disparities in attention regulation shaped by socioeconomic and cognitive factors affect users' ability to resist digital distraction and exercise control over their stimulus

environments. Although the term "attention stewardship" is not yet widely adopted in academic literature, related constructs such as user agency, digital self-regulation, and cognitive agency provide a conceptual foundation for its intent. Giraldo-Luque et al. (2020), while not using the term explicitly, contribute to this foundation by framing attention as a resource that must be intentionally managed, especially in the face of persuasive digital design. A key component of attention stewardship is intentional attention awareness, often referred to as digital awareness. According to Vedechkina & Borgonovi (2021), this element empowers individuals to recognize when their attention is being manipulated or fragmented and to develop the cognitive and behavioral strategies necessary to resist such influence. Despite its relevance, attention stewardship remains underdefined and undermeasured as a standalone psychological or behavioral construct. As digital platforms continue to evolve in complexity and persuasive design, understanding and operationalizing attention stewardship becomes increasingly critical for fostering ethical and empowered digital engagement.

2.2. Digital Privacy Literacy

As of 2025, over 70% of countries have enacted data privacy legislation, reflecting a global shift toward stronger digital rights protections. The European Union continues to lead with the General Data Protection Regulation (GDPR) and the newly enforced Artificial Intelligence Act (AI Act), while countries like Brazil, India, and South Korea have implemented or updated comprehensive frameworks. In Africa, nations such as Cameroon, Ethiopia, and Malawi have introduced GDPR-inspired laws, and the U.S. continues to expand state-level regulations. The literature on digital privacy literacy emphasizes individuals' ability to understand and apply privacy-related knowledge, including legal frameworks, technical protections, and user strategies. Related studies show that digital privacy literacy, defined as users' procedural and declarative knowledge of data protection practices, is positively associated with privacy empowerment and protective behaviors online (Prince, Omrani, & Schiavone, 2024). However, this literacy is often undermined by low attention regulation, which can heighten privacy concerns. Increasingly, scholars recognize that digital privacy literacy and misinformation susceptibility are not isolated phenomena, but interdependent vulnerabilities shaped by shared cognitive and behavioral mechanisms. Studies show that when individuals lack intentional control over their attention, they are more vulnerable to misleading content and exploitative data practices (APA, 2023). Discrepancies between self-assessed and actual privacy literacy can lead to overconfidence and reduced vigilance among frequent digital users, highlighting the need for targeted education and behavioral interventions (Ma & Chen, 2023).

2.3 Misinformation Susceptibility

Low privacy literacy can expose individuals to algorithmic profiling and data-driven content targeting, which in turn amplifies exposure to misinformation. Conversely, misinformation often exploits gaps in privacy awareness, such as misunderstanding data permissions or failing to recognize manipulative design, underscoring the importance of studying these constructs together. Misinformation is recognized in literature as false or misleading content that disrupts public understanding of critical issues, thereby hindering individuals' ability to critically evaluate information, make informed decisions and engage effectively in discourse. In digital contexts, misinformation frequently appears in the form of news articles or social media posts and may be disseminated intentionally, unintentionally, or without explicit malicious intent (Wu et al., 2019). Notably, such content does not always need to be factually incorrect; it may instead involve the distortion of facts, omission of critical context, or reliance on logical fallacies to mislead audiences (Roozen Beek et al., 2025). Scholars have also emphasized the concept of susceptibility to misinformation, which refers to the extent individuals are

vulnerable to being misled due to factors such as low digital literacy, emotional reactivity, or persuasive digital platform designs that exploit cognitive biases (Roozenbeek et al., 2025). Despite the growing body of research on misinformation, investigations into how it spreads interpersonally, and the psychological determinants of susceptibility remain underdeveloped in scholarly discourse (Roozenbeek et al., 2025). While psychological science has made strides in identifying cognitive and emotional factors that influence belief in misinformation, the need for larger, real-world studies that examine how misinformation propagates across social networks and how individual vulnerabilities interact with digital environments to shape susceptibility persists (APA,2023).

2.4 Limited Integration of Privacy and Misinformation Research in Geographic Studies

Digital privacy literacy and susceptibility to misinformation are often treated as separate domains. Broda and Stromback (2024) reviewed 1,200 studies and found that misinformation research is highly fragmented and rarely integrated with privacy-related inquiries. Roozenbeek et al. (2023) similarly identified conceptual and empirical gaps in misinformation interventions, noting that media literacy and fact-checking strategies seldom intersect with digital privacy literacy. ERIC (2022) emphasized that media literacy education frequently omits privacy competencies, reinforcing this divide. Few studies explore shared psychological foundations such as attention management or digital self-awareness. Sultana et al. (2024) found that exposure to misinformation is shaped by platform design and personalization factors tied to privacy literacy practices. Ye et al. (2024) further demonstrated that algorithmic amplification based on user data contributes to misinformation spread, suggesting an indirect link between privacy and misinformation. Roozenbeek et al. (2023) also noted that most studies rely on Western samples, particularly Mechanical Turk and student populations, limiting generalizability. Research involving non-Western contexts and older adults remains scarce, despite their unique digital literacy challenges (Lee, 2018; Petranová et al., 2017). Studies have begun addressing these gaps. Sharevski and Vander Loop (2023) highlighted digital literacy disparities affecting misinformation vulnerability among older and underserved populations. Jongebloed et al. (2024) identified barriers such as cost and trust in rural communities, while Chu et al. (2024) emphasized how digital divides impact health outcomes for older adults. These findings underscore the need for inclusive, context-sensitive interventions that address the intertwined challenges of misinformation and digital privacy.

2.5 Overemphasis on External Interventions

Overreliance on external interventions such as algorithmic moderation and platform-level fact-checking risks can mask the latent erosion of digital privacy. These interventions often prioritize content control over user empowerment, leaving individuals with limited agency in managing their personal data (Prince, Omrani, & Schiavone, 2024). Moreover, the absence of participatory mechanisms in privacy literacy governance contributes to a sense of disempowerment among users. Addressing digital privacy literacy requires a shift from purely external controls to inclusive, user-centered frameworks that foster digital literacy. Similarly, literature on misinformation often emphasizes external interventions such as fact-checking, content moderation, and algorithmic adjustments. Platforms that fail to regulate false content are often perceived as untrustworthy (Roozenbeek, Culloty, & Suiter, 2023).

As a result, users may find it difficult to differentiate between credible and misleading information, which could lead to decision fatigue and increased cynicism. There is comparatively less focus on internal, individual-level strategies such as how users manage their attention and critically evaluate content in digital spaces (APA, 2023). Heuer (2025) and Shin

(2023) cited similar findings, emphasizing education-based strategies such as attention management, promoting media literacy and empowering users to independently verify claims are among the most effective and "scalable" approaches to combating misinformation.

2.6 Underrepresentation of Long-Term Behavioral Outcomes

Existing research emphasizes short-term susceptibility to misinformation or immediate digital privacy literacy behaviors rarely examining long-term behavioral outcomes, a gap compounded by conceptual ambiguity in misinformation research or intervention strategies (Roozenbeek et al., 2023). While many studies focus on immediate reactions such as short-term susceptibility to misinformation or initial responses to privacy literacy, few explore how these behaviors evolve or persist over time. For instance, classroom-based news literacy interventions often yield short-term improvements in students' ability to evaluate news credibility. Nygren and Efimova's (2025) study of 1,215 students found that participants initially improved in evaluating news credibility following classroom-based interventions, yet these gains significantly declined within three months. Anstead et al. (2025) further emphasized that without repeated and context-sensitive approaches, media literacy efforts struggle to produce sustained behavioral change. Moreover, behavioral change is often assessed in isolated, short-term contexts, without follow-up to determine whether individuals continue applying learned strategies later. Despite growing interest in digital privacy, current literature tends to overlook long-term behavioral responses, such as recurring reactions to data breaches or evolving attitudes toward privacy literacy policies.

Shahsavar and Choudhury (2025) highlight that while mobile health apps show promise in improving mental health outcomes, their long-term effectiveness in promoting consistent privacy literacy behaviors is still uncertain. Mamukashvili-Delau et al. (2023) emphasizes the importance of longitudinal research in digital interventions, noting that short-term gains often diminish without ongoing support or reinforcement. Addressing this gap is essential for understanding how sustained attention practices may influence digital resilience over time. While contributors such as Zainudin, Ali, Smeaton, and Ijab (2024), as well as Caled and Silva (2022), have proposed solutions to bridge the gap in pragmatic intervention strategies concerning misinformation, their work highlights the need for a more integrated approach. The concept of human-centered digital vulnerabilities such as low attention stewardship, digital privacy literacy, and susceptibility to misinformation requires systematic exploration of the interrelationships among these challenges to develop more effective and context-sensitive interventions.

2.7 Versatility Psychology and Cognitive Versatility Theory (CVT)

Versatility Psychology (VP) is a developing paradigm that conceptualizes human adaptability as a dynamic, trainable response to fluctuating realities. It emphasizes the flexibility of thoughts, perceptions, and behaviors in response to changing social contexts. Although VP is still in its early stages of theoretical development, its foundational attributes self-awareness, emotion regulation, problem-solving, and interpersonal skills are supported in psychological literature as predictors of resilience, executive functioning, and adaptive behavior (Bandura, 1986; Buhrmester et al., 1988; D'Zurilla & Nezu, 2007; Gross & John, 2003). Bandura (1986) emphasized the role of self-efficacy in shaping intentional behavior, while Gross and John (2003) demonstrated how emotion regulation strategies influence well-being and decision-making. D'Zurilla and Nezu (2010) identified problem-solving as a key mechanism in coping and adjustment, and Buhrmester et al. (1988) established interpersonal competence as central to social adaptation. Versatility Psychology (VP) offers a theoretically

grounded and novel framework for investigating digital behaviors, shifting the analytical focus from external interventions to the internal cognitive and behavioral processes that enable individuals to recalibrate in complex environments such as digital platforms. This emphasis on internal agency can offer a new lens to examine how individuals manage attention, regulate emotion, and adaptively respond to challenges like misinformation and privacy literacy gaps. Within this broader framework, Figure 1 below illustrates CVT, which serves as the conceptual model.

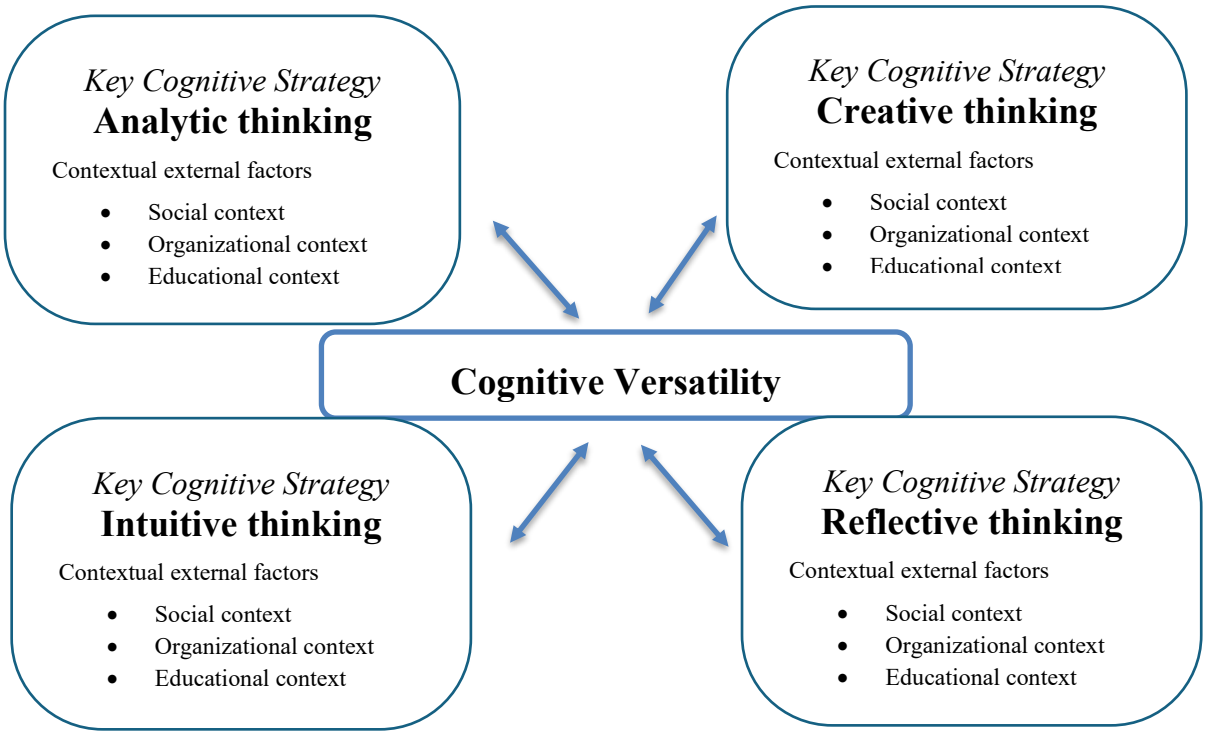

Figure 1. Cognitive Versatility Model

Note: CVT frames attention stewardship as an internal competence that supports digital decision-making and resilience.

3. Research Design

This study employs a mixed methods design, integrating both quantitative and qualitative approaches to examine the development of digital agency through targeted interventions. Mixed methods research allows for a comprehensive understanding of complex phenomena by combining the generalizability of quantitative data with the contextual depth of qualitative insights (Creswell & Plano Clark, 2017). The design follows a convergent parallel strategy, where both data types are collected simultaneously and analyzed independently before being merged for interpretation. This approach supports triangulation and enhances the validity of findings by allowing comparisons across methodological lenses. The quantitative component utilizes validated instruments to measure attributes such as self-awareness, emotional regulation, problem-solving, and interpersonal competence, while the qualitative component explores how these attributes manifest in practice.

The qualitative procedures are grounded in practice-based research, which emphasizes the interdependence of practice and inquiry as a means of generating new knowledge (Vear, 2022). Participants engage in a simulated digital environment designed to activate and observe real-

time responses to modules. This environment serves as both an intervention and a data source, enabling the study of individual agency in context. Behavioral observations, interaction logs, and reflective responses are analyzed thematically to identify patterns related to the four core agency attributes. This approach aligns with Bradbury's framing of practice-based inquiry, where the enactment of practice itself becomes a site of research and insight. The integration of these qualitative findings with quantitative measures provides a strong framework for understanding how digital agency can be cultivated through intentional design.

4. Method Design

Although preregistration was not selected for this study, testing plans including regression models and moderation testing were developed prior to data collection and adhered to established statistical assumptions. This mixed methods study included two distinct samples. The quantitative component involved 100 participants who completed standardized psychometric instruments online to assess digital agency, privacy literacy (via OPLIS), and misinformation susceptibility (via MIST). The qualitative component consisted of a subsample of 10 participants who engaged in a structured digital simulation designed to observe real-time responses to privacy and misinformation challenges. Guided by CVT, the study examined whether low attention stewardship predicts higher susceptibility to misinformation and lower privacy literacy.

A linear regression was used to assess the predictive relationship between attention stewardship and misinformation susceptibility while a multivariate regression evaluated its influence across both outcomes (Tabachnick & Fidell, 2019). To explore the moderating role of psychological versatility (VP), a multiple regression model with interaction terms was applied using composite scores derived from validated instruments. To ensure construct validity, all instruments were scored according to their original validated formats, preserving the integrity of each instrument to reduce measurement error and support the reliability of this methodology. Given VP's emphasis on adaptive psychological competencies, a moderation analysis was conducted to explore its potential buffering effects. Assumptions for each statistical procedure were checked prior to analysis, and internal consistency for each composite score was calculated and reported in the results.

4.1 Hypotheses

- H0*:* There is no statistically significant relationship between attention stewardship and susceptibility to digital misinformation.
- H1: Higher levels of attention stewardship will be significantly associated with lower susceptibility to digital misinformation.
- H2: Individuals with lower attention stewardship (digital agency) will demonstrate lower privacy literacy compared to those with higher attention stewardship.
- H3: Self-awareness, emotion regulation, interpersonal skills and problem-solving abilities will moderate the relationship between attention stewardship, misinformation susceptibility and digital privacy literacy.

4.2 Population and Sample

The target population for this study consists of adult participants with regular engagement in digital environments, such as social media, online learning platforms, or digital communication tools. This population is appropriate given the study's focus on digital agency (attention stewardship) and decision making and aligns with prior research examining behavioral

responses to misinformation and privacy literacy gaps in digitally active individuals (Guess et al., 2019; Marwick & Lewis, 2017). Participants ranged in age from 18 to 65 years (M = 34.2), with approximately 58% identifying as female, 40% as male, and 2% as nonbinary. The sample included individuals from diverse educational backgrounds, with 62% holding college degrees and 87% reporting regular engagement with digital platforms such as social media, online learning environments, or digital communication tools.

Recruitment was conducted via LinkedIn, university libraries, and local media centers, resulting in geographic representation across multiple U.S. regions. For the quantitative component, a priori power analysis using G Power 3.1 (Faul et al., 2009) suggests a minimum sample size of 100 participants to detect medium effect sizes of .30 in regression models with one predictor and two outcome variables, assuming $\alpha = .05$ and power = .80. This estimate follows the general rule of thumb recommending 10–15 participants per predictor variable in regression analysis (Tabachnick & Fidell, 2019). For the qualitative component, thematic saturation is expected with 10-15 participants consistent with qualitative research standards for feedback and focus group studies (Guest et al., 2006).

4.3 Instrument Reliability and Validity

4.3.1 Attention Control Scale (ATTC)

The Attention Control Scale (ATTC; Derryberry & Reed, 2002) is a 20-item measure assessing attention focusing and shifting. Items are rated on a 4-point Likert scale (1 = almost never, 4 = always), with total scores ranging from 20 to 80; higher scores indicate stronger attentional control. Factor analyses support a two-factor structure, and prior studies report strong internal consistency ($\alpha = .88$). Construct validity has been demonstrated through positive correlations with extraversion ($r = .40$) and negative correlations with trait anxiety ($r = –.55$). ATTC has been widely applied in research on cognitive regulation, emotional resilience, and attentional bias.

4.3.1.1 Construct Validity Justification for Attention Stewardship (ATTC Proxy)

Currently, no psychometrically validated instrument directly measures attention stewardship in digital contexts; therefore, ATTC was selected as the most theoretically relevant proxy. Attention stewardship is defined as the intentional regulation of focus and recalibration of attention in dynamic digital environments. ATTC's dimensions attentional focusing and shifting represent core processes underlying this construct. Internal consistency for the present sample was acceptable ($\alpha = .71$), and prior research confirms a stable two-factor structure. Convergent validity is supported by strong associations between ATTC scores and digital outcomes in this study (privacy literacy and misinformation susceptibility), consistent with theoretical expectations. While ATTC does not capture digital-specific features, its conceptual overlap and empirical performance provide a defensible proxy. This limitation is acknowledged and further addressed in Section 8 (Limitations).

4.3.2. Online Privacy Literacy Scale

The 20-item Online Privacy Literacy Scale (OPLIS), developed by Masur et al. (2017), assesses individuals' factual knowledge across four dimensions: institutional practices, technical data protection, legal frameworks, and user privacy strategies. Derived from an initial pool of 113 items and refined through three consecutive studies, the scale was validated using

a quota sample of 1,945 German internet users. Exploratory and confirmatory factor analyses supported a bifactor model, with a global factor representing overall online privacy literacy. Internal consistency was strong, with Cronbach's alpha values ranging from .70 to .89 across dimensions. Construct validity was demonstrated through significant correlations with self-assessed privacy competence, and criterion validity was confirmed by the scale's ability to predict actual privacy literacy behaviors, such as protective strategy use and awareness of data collection.

4.3.3 Misinformation Susceptibility Test (MIST)

The Misinformation Susceptibility Test (MIST), developed by Maertens et al. (2024), is a validated tool designed to assess individuals' ability to distinguish real from fake news headlines. Created using a neural network-based item generation process and refined across seven samples (N = 8,504), MIST includes three versions (MIST-20, MIST-16, MIST-8) with binary response formats and sub-two-minute completion times. Factor analysis supports a multidimensional structure with five indices: veracity discernment, real news detection, fake news detection, distrust bias, and naïveté bias. Internal consistency is strong (α = .76–.82), and construct validity is supported by correlations with my side bias (r = .45) and political partisanship (r = .41), while cognitive reflection and numeracy show weaker associations (r < .20). Although formal test-retest reliability is not reported, longitudinal data over two years indicate stable predictive patterns.

4.3.4 Awareness Outcomes Measure (AOM)

Sutton and Medvedev (2023) designed the Awareness outcomes measurement to assess self-awareness outcomes across personal, relational, and societal domains. The AOM consists of 21 items rated on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." Confirmatory factor analysis confirmed validity across a diverse sample of 713 participants from three English-speaking countries. The analysis supported a unidimensional structure, with item fit statistics within acceptable ranges and no significant differential item functioning across sex, age, or country. Internal consistency was strong, with Cronbach's alpha = .91, indicating high reliability. Construct validity was demonstrated through significant correlations with related measures of mindfulness, psychological flexibility, and well-being (*r* values ranging from .42 to .61).

4.3.5 Interpersonal Competence Questionnaire (ICQ)

The Interpersonal Competence Questionnaire (ICQ) is a 40-item instrument assessing social and emotional skills across five domains: relationship initiation, negative assertion, self-disclosure, emotional support, and conflict management (Buhrmester et al., 1988). Items are rated on a 5-point Likert scale, reflecting perceived competence in each domain. Validation studies, including cross-cultural adaptations, confirmed the five-factor structure through exploratory and confirmatory factor analyses. Internal consistency was strong (α = .77–.87), and test-retest reliability (n = 59) demonstrated temporal stability. Convergent validity was supported by positive correlations with empathy, psychological well-being, extraversion, and emotional clarity, and negative associations with neuroticism and emotion dysregulation. The ICQ's psychometric properties were reaffirmed through factor analysis in 2016.

4.3.6 Emotion Regulation Questionnaire (ERQ)

The Emotion Regulation Questionnaire (ERQ) is a 10-item self-report instrument designed to assess individuals' habitual use of two emotion regulation strategies: cognitive reappraisal and expressive suppression (Gross & John, 2003). Items are rated on a 7-point Likert scale, reflecting the frequency with which respondents engage in each strategy. Validation studies have consistently supported the ERQ's two-factor structure through exploratory and confirmatory factor analyses across diverse populations and cultural contexts. Internal consistency is strong, with Cronbach's alpha values ranging from .70 to .85 for the subscales. Test-retest reliability has been demonstrated, indicating temporal stability. Convergent validity is supported through significant correlations with measures of psychological well-being, life satisfaction, mood repair, and social support, while expressive suppression is positively associated with depression, anxiety, and inauthenticity.

4.3.7 Cognify Assessment

The Cognify Assessment, developed by Criteria Corp, is a gamified cognitive ability tool measuring problem-solving, numerical reasoning, and processing speed through six mini games tailored to digital environments. Validation studies support a general cognitive ability (g) factor across tasks (Van Lill et al., 2023), with high internal consistency, though exact alpha values remain proprietary. Independent research shows a moderate correlation ($r = .51$) with traditional cognitive tests, confirming construct-related validity (Ohlms et al., 2023). Cross-cultural validation in South African and Australian samples confirmed partial metric and scalar invariance, supporting generalizability across diverse populations.

4.4 Statistical Analysis

4.4.1 Quantitative

To explore the relationships between attention stewardship, digital privacy literacy, and misinformation susceptibility, this study employs a series of validated psychometric instruments. Attention stewardship is measured using the Attention Control Scale (ATTC), digital privacy literacy via the Online Privacy Literacy Scale (OPLIS), and misinformation susceptibility through the Misinformation Susceptibility Test (MIST). A linear regression analysis was conducted to determine whether attention stewardship significantly predicts misinformation susceptibility, which is appropriate for evaluating the strength and direction of a single predictor-outcome relationship (Field, 2018). To further examine the predictive power of attention stewardship across multiple outcomes, a multivariate regression analysis was used to assess its influence on both privacy literacy and misinformation susceptibility (Tabachnick & Fidell, 2019).

Additionally, participants completed instruments aligned with the four core components of the novel Versatility Psychology (VP): self-awareness, emotion regulation, interpersonal skills, and problem-solving. These are measured using the Awareness Outcomes Measure (AOM), Emotion Regulation Questionnaire (ERQ), Interpersonal Competence Questionnaire (ICQ), and the Cognify assessment by Criteria Corp, respectively. Composite scores from these VP instruments were used in subsequent moderation analyses to explore how cognitive versatility may influence the relationships between predictors and outcomes.

4.4.2 Qualitative Component: Practice-Based Research Intervention

This study incorporates a qualitative module grounded in practice-based research, designed to observe and analyze participants' cognitive and behavioral responses within a structured digital simulation and sample size of 10 participants. The intervention is informed by components of Versatility Psychology (VP) and the Cognitive Versatility Theory (CVT), particularly the ACIR model (Analytical, Creative, Intuitive, Reflective thinking). Prior to entering the simulation, participants are introduced to four core competencies derived from psychological literature that support adaptive digital engagement. These competencies serve as internal mechanisms for navigating complex digital environments: self-awareness, emotional regulation, interpersonal skills, and problem-solving.

Participants then engage with a series of simulated digital scenarios designed to activate these competencies in real time. Responses are collected asynchronously through the simulation platform and analyzed using a qualitative coding framework aligned with the ACIR model. This approach allows for the identification of patterns in cognitive versatility and digital agency. The practice-based methodology treats research and practice as interdependent processes, generating original insights through enactment and reflection. This design supports the study's aim to explore individual agencies in digital environments and contributes to the development of scalable context-sensitive interventions for improving attention stewardship and digital decision-making.

4.5 Respect for Participant Rights and Ethical Considerations

This study adheres to ethical principles outlined by the U.S. Department of Health and Human Services (DHHS) and the Common Rule (45 CFR 46) for research involving human subjects. The protocol prioritizes autonomy, privacy, and psychological safety. Participants will receive clear informed consent forms detailing the study's purpose, procedures, and their right to withdraw without penalty. No personally identifiable information was collected; responses will remain anonymous and confidential. The simulation qualifies as a benign behavioral observation involving minimal risk and no deception. All instruments are validated and non-invasive, and the study excludes vulnerable populations.

5. Triangulation and Researcher Bias

To ensure credibility and coherence, this mixed methods study integrates practice-based simulation with quantitative analysis. Practice-based research treats inquiry as interdependent, generating original insights. Statistical findings from regression models are contextualized within the simulation, where structured reflection reveals emergent themes. Rather than traditional triangulation, the study employs methodological complementarity, aligning statistical outcomes with qualitative insights. The researcher maintained critical contextualization throughout the evolving simulation. Quirkos (2023), a qualitative analysis tool, was used to support transparent coding and visualization of practice-derived data. Structured thematic analysis enabled the identification of patterns aligned with the ACIR model, enhancing clarity and interpretation. To ensure methodological rigor and mitigate researcher bias, reflexive documentation practices including analytic memos and decision logs were employed throughout the coding process. These strategies align with best practices in solo qualitative research and support the credibility and trustworthiness of the research findings.

6. Instrumentation

The study utilized a battery of validated psychometric instruments to measure attention stewardship (digital agency), privacy literacy, misinformation susceptibility, and core psychological competencies. All instruments were administered online, with study access provided via LinkedIn, outreach to local universities and libraries and media centers. The study remained open for six months to ensure a diverse and generalizable sample. Composite scores were computed for the ATTC, and internal consistency for this scale was assessed using Cronbach's alpha for the present sample. For the OPLIS and MIST instruments, composite scores were calculated as the total number of correct responses, consistent with their original validated formats. The quantitative portion required 10–15 participants to complete a practice-based simulation, which offered structured digital scenarios for observing real-time attention management and decision-making.

7. Results

7.1 Quantitative Results

Scores were calculated for a sample of 100 participants. ATTC scores represent the sum of Likert-scale items, while OPLIS and MIST scores represent the total number of correct responses for each instrument to preserve their original scoring structure. These scores were derived from standardized instruments to yield a singular indicator of each construct, consistent with the study's emphasis on attention stewardship and the goal of reducing model complexity. Although subscale scores were examined for reliability, they were excluded from the primary analyses to maintain focus on overall construct-level effects. An a priori power analysis indicated that 85 participants were needed to detect a medium effect (f2= .15) at $\alpha = .05$ with 80% power. The observed effect size for the primary model (ATTC predicting MIST) was f2 = .53, which exceeds this threshold, indicating that the study was adequately powered. Cronbach's alpha was calculated to assess internal consistency for the ATTC instrument and its subscales. The overall ATTC scale demonstrated acceptable reliability ($a = .71$). Internal consistency for the two dimensions was moderately high: Dimension 1 ($a = .74$) and Dimension 2 ($a = .72$), supporting the construct validity of the instrument.

A linear regression analysis was conducted to determine whether attention stewardship significantly predicts misinformation susceptibility indicating R2 = .345, $p < .001$, Beta = –.45, 95% CI –.60 to –.30, suggesting that higher attention stewardship is associated with lower susceptibility to misinformation. Similarly, ATTC significantly predicted privacy literacy (R2 = .581, $p < .00$; Beta = .72, 95% CI .58 to .86.), indicating that greater attention stewardship is associated with higher privacy literacy. To account for potential confounding factors, a multiple regression analysis was conducted including demographic and behavioral covariates (age, education and platform use).

After controlling for these covariates, ATTC remained a significant predictor of misinformation susceptibility (beta= –.45, $p < .001$). The adjusted model explained 38% of the variance in misinformation susceptibility (adjusted R2 = .38), compared to 34.5% in the unadjusted model. Among the covariates, platform use (beta= .20, $p = .001$) and age (beta = .12, $p = .018$) were significant predictors. For privacy literacy, ATTC continued to show a positive effect (beta = .72, $p < .001$), with an adjusted R2 of .59. Model diagnostics indicated normal residuals and homoscedasticity (Jarque–Bera p = .72; Breusch–Pagan p = .34; max Cook's D = .23), and variance inflation factors were below 2.0. Results are displayed in the Table 1.

Tables 1. Mutivariate Regression

Model	Outcome	R2	Adjusted R2	Predictor	Beta	95% CI	p	JB	BP	Cook's D
1	MIST	.345	—	ATTC	-0.45	-0.60 to -0.30	<.001	.72	.34	.23
2	OPLIS	.581	—	ATTC	0.72	0.58 to 0.86	<.001	.004	.59	.18
3	MIST (covariates)	—	.380	ATTC	-0.45	-0.60 to -0.30	<.001	—	—	—
				Platform Use	0.20	0.08 to 0.32	.001	—	—	—
				Age	0.12	0.02 to 0.22	.018	—	—	—
4	OPLIS (covariates)	—	.590	ATTC	0.72	0.58 to 0.86	<.001	—	—	—

Note: Table includes coefficients (Beta), 95% confidence intervals, and key diagnostics (JB P, BP P, Cook's D).

Finally, moderation analysis was conducted to evaluate whether psychological versatility (VP) influences these relationships. VP composite scores were derived from three validated instruments: AOM, the ICQ, and the ERQ, with simulated Cognify percentile scores representing problem-solving ability. Interaction terms were tested within regression models. All interaction terms were significant at $p < .001$. For example, the interaction between ATTC and AOM (self-awareness) predicted misinformation susceptibility (beta = –.22, 95% CI –.29, –.16) and privacy literacy (beta = .33, 95% CI .26, .40). Similarly, the interaction between ATTC and Cognify (problem-solving) was significant for misinformation (beta = –.009, 95% CI –.011, –.006) and privacy literacy (beta = .010, 95% CI .008, .013). Diagnostics confirmed normality, homoscedasticity, and absence of multicollinearity across all moderation models. Results are displayed in Table 2.

Table 2. Moderation Models

Outcome	Moderator	Interaction	Beta	95% CI	p	VIF	JB p
MIST	AOM	ATTC x AOM	-0.22	-0.29 to -0.16	<.001	1.22	.14
MIST	ICQ	ATTC x ICQ	-0.18	-0.24 to -0.12	<.001	1.19	.13
MIST	ERQ	ATTC x ERQ	-0.15	-0.21 to -0.09	<.001	1.20	.12
MIST	Cognify	ATTC x Cognify	-0.009	-0.011 to -0.006	<.001	1.18	.09
OPLIS	AOM	ATTC x AOM	0.33	0.26 to 0.40	<.001	1.22	.97
OPLIS	ICQ	ATTC x ICQ	0.28	0.21 to 0.35	<.001	1.19	.95
OPLIS	ERQ	ATTC x ERQ	0.25	0.18 to 0.32	<.001	1.20	.96
OPLIS	Cognify	ATTC x Cognify	0.010	0.008 to 0.013	<.001	1.18	.94

Findings indicated that the interaction between VP and attention stewardship was not statistically significant, suggesting that psychological versatility did not moderate attentional

control in this sample. In contrast, interaction terms involving VP and both privacy literacy ($p < .001$) and misinformation susceptibility ($p < .001$) were highly significant, indicating robust moderating effects. Results confirmed that attention stewardship was a significant predictor of both outcomes, supporting the hypothesis that intentional attention management plays a measurable role in misinformation discernment and privacy literacy. These findings suggest that while psychological versatility may not influence attention stewardship directly, it plays a meaningful role in shaping how individuals engage with digital privacy and misinformation.

7.2 Qualitative Results

This study applied a practice-based research framework to examine how ten participants engaged with simulated digital dilemmas designed to activate core psychological attributes. As Bradbury (2022) defines, practice-based research is "a principled approach to research by means of practice, in which the research and the practice operate as interdependent and complementary processes leading to new and original forms of knowledge." The qualitative component utilized an interactive branching simulation hosted on YoScenario (Covington, 2025): https://player.yoscenario.com/3720-3530-8n589GHUqkcGJ2x4. Participants completed a structured scenario consisting of four modules replicating real-world challenges in misinformation discernment, privacy decision-making, and attention management. Each module presented dynamic stimuli such as fake news headlines, privacy consent prompts, and multitasking notifications, requiring participants to make decisions under time constraints and provide short reflective responses.

The simulation lasted approximately 25 minutes per participant and combined multiple-choice decision points with open-ended reflection tasks to capture both behavioral and cognitive processes. Scenario design was guided by the ACIR model (Analytical, Creative, Intuitive, Reflective thinking) and aimed to activate Versatility Psychology competencies: self-awareness, emotional regulation, interpersonal skills, and problem-solving. Branching logic ensured that participant choices influenced subsequent prompts, creating an adaptive experience that mirrored real-world digital complexity. Qualitative data were analyzed using Braun and Clarke's (2006) six-phase thematic analysis.

Initial codes were deductively derived from ACIR dimensions and inductively refined during analysis. Coding was conducted in Quirkos, which supported visualization and transparency. Although coding was performed by a single researcher, reflexive memos, iterative codebook refinement, and decision logs were employed to enhance reliability, consistent with best practices for solo qualitative research. Thematic analysis revealed three dominant themes. The first theme, Overlooked Attention Stewardship, reflected participants' tendency to bypass critical evaluation of digital content, engaging passively or impulsively. Comments included "I didn't really read the whole thing, but it looked legit" and "I usually just scroll past stuff unless it's really dramatic." The second theme, Fragmented Problem-Solving, indicated that decision-making was reactive and intuition-driven rather than structured. Examples included "I just went with my gut because it felt right" and "I skipped the instructions and just clicked through."

The third theme, Emotional Reactivity Over Regulation, captured impulsive responses and avoidance behaviors in emotionally charged scenarios. Statements included "It made me angry, so I commented without thinking" and "I felt overwhelmed and just closed the app." Across all themes, Versatility Psychology attributes of self-awareness, emotional regulation, interpersonal skills, and problem-solving were inconsistently applied, indicating low cognitive agency in tasks requiring sustained attention or critical evaluation. These findings support the hypothesis that diminished attention stewardship contributes to increased susceptibility to

misinformation and privacy literacy challenges. While participants demonstrated latent digital competencies, their activation was inconsistent and often undermined by emotional and cognitive constraints. Thematic code summaries are available upon reasonable request to the corresponding author, subject to IRB compliance Figure 2 illustrates the simulation interface and thematic coding structure

Simulation Question	Responses	Thematic Codes	Themes
Viral post claiming a health supplement cures anxiety in 24 hours.	I didn't really read the whole thing, but it looked legit.	Impulsivity / Low Cognitive Agency	Overlooked Attention Stewardship
You receive a link in a message. Do you click it immediately?	I clicked through without thinking, it's just a habit now.	Impulsivity / Low Cognitive Agency	Overlooked Attention Stewardship
You want to share a post. Do you verify its accuracy first?	I don't think I've ever stopped to check if something was true before sharing.	Naivety / Low Self-Awareness	Overlooked Attention Stewardship
You're asked to choose between two privacy settings. How do you decide?	I just went with my gut because it felt right.	Lack of Analytical Thinking	Fragmented Problem Solving
You're asked to evaluate a privacy policy. What do you do?	I didn't really try to figure it out, I just picked the easiest option.	Limited Problem Solving	Fragmented Problem Solving
Headline: Your children are being tracked online and no one is stopping it.	I didn't want to challenge the post because it might upset someone.	Low Interpersonal Awareness	Emotional Reactivity Over Regulation
Friend shares political post you disagree with.	It made me angry, but I did not comment without thinking first.	Interpersonal skills / Emotional Regulation	High interpersonal skills and emotional regulation
You're exposed to multiple conflicting posts. How do you respond?	I felt overwhelmed and just closed the app.	Avoidance / Low Emotional Regulation	Emotional Reactivity Over Regulation
App updates terms to allow third party data sharing	Review for details and disclosures	Skepticism	High self awareness and problem solving

Figure 2. Signal vs. noise: A simulation of digital agency in the age of misinformation

8. Limitations

Several limitations are present such as potential response bias from self-report measures and the controlled simulation environment which may not fully capture real-world digital behavior. A key limitation is the absence of a psychometrically validated instrument that directly measures attention stewardship in digital contexts, which limits the precision of construct representation. Additionally, the integration of multiple psychometric tools may have contributed to participant fatigue as the study design assumed a baseline level of digital literacy that may vary across individuals. Because all quantitative data were collected via self-report instruments, common method bias may have influenced observed relationships. Future research should incorporate multi-method approaches, such as behavioral tracking or experimental designs, to mitigate this risk. The sample was U.S. centric lead, recruited through LinkedIn, and university media centers which may restrict generalizability to other cultural or demographic contexts. Furthermore, participants were aware they were engaging in a research simulation, which could have introduced demand characteristics and influenced decision-making. These limitations underscore the need for continued refinement of measurement tools, replication across diverse populations, and the development of validated instruments tailored to digital attention stewardship. Future studies should also consider embedding tasks in naturalistic environments and employing longitudinal designs to strengthen construct validity and generalizability.

9. Conclusion

This study affirms the Cognitive Versatility Theory (CVT) as a meaningful framework for understanding digital agency, positioning attention stewardship not merely as a behavioral outcome but as a core adaptive competence rooted in internal psychological architecture. Attention stewardship demonstrated a robust negative association with misinformation susceptibility and a strong positive association with privacy literacy. These effects remained significant after controlling for demographic and behavioral covariates, supporting the

theoretical proposition that intentional attention management plays a protective role in digital environments. The null hypothesis that attention stewardship does not significantly influence susceptibility to misinformation was rejected, reinforcing the premise that intentional attention management plays a protective role in digital environments. In a landscape increasingly shaped by algorithmic persuasion and voluntary exposure to data-driven systems, internal constructs such as self-awareness, emotional regulation, interpersonal competence, and problem-solving are surfacing as counterweights to digital vulnerability. These competencies, explored through the lens of Versatility Psychology (VP), offer a human-centered pathway for cultivating digital resilience. Attention stewardship was operationalized using the Attention Control Scale (ATTC) as the most theoretically relevant tool for intentional attentional regulation. Although ATTC does not directly measure digital-specific attention stewardship, its validated focus on attentional control aligns conceptually with the study's framework. Future research should develop and validate instruments tailored to digital contexts.

The simulation served as a critical anchor in this inquiry, functioning as both an intervention and a data collection tool. The moderation model was grounded in pre-registered hypotheses specifying that Versatility Psychology (VP) competencies of self-awareness, emotional regulation, interpersonal skills, and problem-solving would buffer the effects of attention stewardship on misinformation susceptibility and privacy literacy. This theoretical rationale reflects VP's emphasis on adaptive cognitive flexibility as a protective factor in complex digital environments. Participants engaged in branching digital scenarios that required real-time decision-making across misinformation, privacy literacy, and attention management challenges. These modules were designed to activate VP traits and assess cognitive versatility in context, offering a dynamic alternative to static survey-based interventions. Taking together, these results highlight critical directions for future scholarship and practical interventions. Beyond empirical findings, the literature review underscores a pressing academic and societal need to produce more scholarship and curriculum-based interventions that elevate individual agency in digital environments.

This includes the strategic skill of digital ignoring, the intentional disengagement from manipulative or irrelevant content, which remains underrepresented in formal education and public discourse (Kozyreva et al., 2023). The findings of this study point to a frontier for advocacy: the development of modular, scalable training designs that place users in the driver's seat of their digital experience. Such interventions must move beyond reactive content moderation and instead foster proactive cognitive engagement, aligning attention with personally meaningful goals and reinforcing ethical autonomy. Ultimately, this research contributes to a growing body of work that reframes digital responsibility through behavioral and cognitive lenses. Validation of the CVT model and the utility of VP as a conceptual scaffold provide a replicable framework for future research and interventions, emphasizing the individual's role as an active agent managing digital complexity. These findings support the development of modular training programs that integrate VP competencies into digital literacy curricula.

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