



## Digital Dopamine: The Awareness-Behavior Paradox in Social Media Usage

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### Abstract

Social media platforms have become ingrained in daily life in recent years, especially among young adults and college students. Although these platforms provide opportunities for communication, entertainment, and information exchange, concerns about excessive screen time and its behavioral and psychological effects are becoming more widespread. Despite this growing awareness, a paradox exists between knowledge and behavior: many users continue to use social media obsessively despite widespread recognition of these potential risks. This study examines the phenomenon commonly referred to as the awareness-behavior paradox in social media use, in which users are aware of the harmful effects of excessive screen time yet are unable to reduce their screen time. Through a quantitative survey of 500 university students, this study examines how specific platform design is theoretically associated with reward-related psychological processes that may contribute to habitual engagement and reduced self-regulation.

Utilizing the Stimulus-Organism-Response (SOR) framework, our findings reveal that infinite scroll ( $r=0.478$ ,  $p<0.001$ ) and auto-play features ( $r=0.432$ ,  $p<0.001$ ) significantly correlate with habit automaticity. Notably, 38.2% of respondents exhibited the core paradox: high awareness coupled with continued compulsive use. Furthermore, social validation metrics ( $r=0.543$ ,  $p<0.001$ ) emerged as powerful drivers of habit formation, confirming that variable reward mechanisms are associated with continued engagement despite awareness of potential risks. A positive correlation between user awareness and paradoxical behavior ( $r=0.624$ ,  $p<0.001$ ) demonstrates that cognitive knowledge alone is insufficient to alter digital habits. The research concludes that mitigating social media addiction requires a shift from user-level self-regulation to structural platform interventions, advocating the integration of ethical friction into application design.

**Keywords:** *Digital Dopamine, Awareness-Behavior Paradox, Social Media Addiction, Platform Engineering.*

### 1. Introduction

Social media platforms have become deeply embedded in the daily routines of young adults, shaping patterns of attention, emotion, and social interaction. For many university students, engagement begins shortly after waking and continues intermittently throughout the day, often extending late into the night. Much of this interaction occurs in brief, habitual checks triggered by notifications, boredom, or social cues rather than deliberate intention. Although users commonly recognize that excessive use can impair productivity, academic performance, sleep quality, and mental well-being, disengagement remains challenging to address. Efforts to reduce usage are often short-lived, revealing a persistent gap between reflective awareness and actual behavioral control.

As of 2025, active internet users comprise more than 68% of the global population, with individuals spending an average of approximately 2.5 hours per day on social media platforms (Kemp, 2025). The continued upward trajectory suggests not only broader global access to digital infrastructure but also deeper behavioral integration of social media into everyday routines. While early stages of social media adoption were characterized primarily by communication and networking functions, recent years have seen a transformation toward algorithm-driven, short-form, high-velocity content ecosystems. The increase in average daily usage time reflects this structural shift, as platforms increasingly optimize user engagement through immersive design architectures. Compared to earlier years, contemporary usage patterns show both more frequent access and shorter intervals between sessions, indicating that social media has evolved from a periodic activity into a persistent background presence in daily life. This longitudinal growth provides important context for examining the awareness-behavior paradox, as rising usage levels over time suggest that increased public awareness of digital well-being concerns has not been accompanied by reduced engagement. This pattern reflects a broader conceptual tension in contemporary digital behavior commonly described as the awareness-behavior paradox, the discrepancy between

recognizing the potential harm of a behavior and successfully modifying it (Kuss & Griffiths, 2017). In the context of social media use, individuals often possess cognitive awareness that excessive engagement may negatively influence their health and offline lives. Nevertheless, many users report difficulty reducing or regulating their consumption despite this understanding.

The persistence of this paradox is particularly notable as social media platforms have evolved from relatively simple communication tools into highly optimized engagement systems structured to sustain user attention (Alter, 2017). Contemporary platforms incorporate design architectures grounded in principles of persuasive technology systems intentionally structured to shape user attitudes and behaviors (Fogg, 2009). Such features include infinite scroll mechanisms that remove natural stopping cues (Amirthalingam & Khera, 2024), algorithmic recommendation systems that personalize and continuously refresh content streams (Montag et al., 2019), strategically timed push notifications that re-engage users (Pielot et al., 2014), and social validation indicators such as likes and comments that activate reward-related neural processes (Sherman et al., 2016). In attention-based economic models, these interface features are not incidental; rather, they are structurally aligned to maximize user engagement and time on the platform (Zuboff, 2019). Consequently, the awareness–behavior paradox, where users recognize the risks of excessive use yet fail to regulate their consumption, should not be viewed solely as a failure of individual self-control. Instead, this divergence highlights a critical gap in current understanding: the phenomenon is best explained as an asymmetric interaction between human cognition and increasingly sophisticated, engagement-oriented platform architecture. Building on this perspective, the present study seeks to examine this interaction more systematically. To better understand this phenomenon, the research paper investigates how specific design features influence internal psychological processes that shape behavior. Accordingly, the study applies the Stimulus–Organism–Response (SOR) framework to investigate how platform stimuli relate to psychological mechanisms such as habit automaticity and emotional reinforcement, and how these processes ultimately contribute to continued engagement despite conscious awareness of risks. By clarifying these relationships, this research aims to explore the theoretical understanding of the awareness–behavior paradox and contribute to ongoing discussions in digital psychology and behavioral science.

## 2. Literature Review

### 2.1 Digital Dopamine and Neurological Mechanisms

Dopamine is a neurotransmitter centrally involved in motivation, reinforcement learning, and reward anticipation. Importantly, neuroscientific research indicates that dopaminergic activity is more strongly associated with the anticipation of reward than with the direct experience of pleasure (Berridge & Robinson, 2016; Schultz, 2016). Rather than simply signaling enjoyment, dopamine increases the motivational salience of cues that predict potential rewards, thereby promoting goal-directed behavior. In digital environments, this mechanism becomes particularly relevant as social media platforms frequently present users with unpredictable stimulus such as notifications, likes, comments, and continuously refreshed content feeds—that may function as variable rewards. Variable reinforcement schedules are known to strengthen behavioral persistence by maintaining anticipation of reward (Skinner, 1953). Accordingly, the intermittent and unpredictable nature of social feedback on social media may activate reward-related motivational systems, encouraging repeated checking behavior, even in the absence of deliberate intention (Montag et al., 2019; Sherman et al., 2016).

The neural processes underlying reinforcement learning are commonly associated with activation of the mesolimbic dopamine pathway, a circuit connecting the ventral tegmental area (VTA) to the nucleus accumbens and related limbic structures. This pathway plays a central role in encoding reward prediction, motivational salience, and habit formation (Berridge & Robinson, 2016; Schultz, 2016). Importantly, contemporary neuroscience emphasizes that dopamine’s primary function is not the direct generation of pleasure, but rather the signaling of reward anticipation and reward prediction error, mechanisms that motivate goal-directed behavior and reinforce repeated actions (Schultz, 2016). In this context, when environmental cues reliably predict potential rewards, dopaminergic activity increases, strengthening associative learning between stimuli and behavioral responses. Over time, repeated activation of this system may facilitate the transition from deliberate, effortful

engagement to more automatic, cue-driven behavioral patterns. Applied to digital settings, in environments characterized by intermittent and unpredictable feedback, such anticipatory signaling processes may contribute to the persistence of repeated checking behaviors, even when subjective enjoyment diminishes. Digital platforms may engage anticipatory reward mechanisms by implementing variable reinforcement systems, a pattern well-established in behavioral psychology. Features such as engagement notifications, social validation cues (e.g., likes and reactions), and continuously refreshed content feeds provide intermittent and unpredictable feedback that may sustain reward anticipation and encourage repeated checking behavior (Montag et al., 2019; Sherman et al., 2016). Rather than directly “triggering dopaminergic surges,” it is more precise to state that these features are theoretically consistent with activation of reward-related neural systems involved in reinforcement learning (Schultz, 2016). Over time, repeated exposure to readily accessible, low-effort digital rewards may strengthen habitual engagement patterns. The minimal behavioral cost, often requiring only a swipe or tap, reduces cognitive friction and facilitates cue-driven responses over reflective decision-making (Alter, 2017; Fogg, 2009). Research on habit formation indicates that repeated reinforcement within stable contexts can shift behavior from deliberate action toward more automatic routines (Everitt & Robbins, 2016). Consequently, habitual digital engagement may persist even when users are cognitively aware of its negative effects, contributing to the awareness–behavior paradox observed in social media use.

Termann’s (2025) Dopamine Collapse Hypothesis further suggests that contemporary technologies may reshape reward environments by reducing the effort traditionally required to obtain reinforcement. In this framework, highly accessible digital stimuli function as “supernormal” cues that intensify anticipatory engagement. Under such conditions, continued usage may increasingly reflect reinforcement-driven habit processes rather than sustained subjective enjoyment, potentially reinforcing engagement even when users report diminished satisfaction. In turn, users may continue engaging with digital platforms even when the experience is no longer particularly rewarding, highlighting the paradoxical persistence of use despite declining satisfaction.

## 2.2 Persuasive Platform Design and Engagement Optimization

Persuasive technology refers to the intentional design of interactive systems aimed at influencing user attitudes and behaviors (Fogg, 2009). In social media environments, platform architectures incorporate features such as infinite scroll, auto-play, and personalized content feeds that reduce natural stopping cues and encourage prolonged engagement (Alter, 2017). By minimizing friction and continuously refreshing content streams, these systems are structured to extend session duration within attention-based economic models (Zuboff, 2019).

Algorithmic recommendation systems further personalize content delivery by analyzing large-scale behavioral data and adapting feeds to individual preferences and interaction histories. Research suggests that such adaptive systems may shape attention patterns through continuous optimization, reinforcing engagement without relying on overt persuasive messaging (Montag et al., 2019).

Short-form video platforms intensify engagement dynamics by combining rapid content turnover with algorithmic curation, creating immersive consumption patterns that may reduce opportunities for reflective disengagement (Montag et al., 2019). Algorithmic recommendation systems are designed to personalize content streams by analyzing users’ interaction histories and behavioral signals, thereby reinforcing engagement through iterative feedback mechanisms (Covington et al., 2016; Gillespie, 2014). Such adaptive systems continuously optimize content delivery based on prior engagement, which can strengthen habitual interaction patterns over time. Additionally, strategically timed notifications and predictive engagement models may prompt re-entry into the platform based on inferred user states, effectively positioning the interface as a recurring behavioral cue embedded within everyday digital routines (Fogg, 2009; Pielot et al., 2014).

## 2.3 Cognitive Processing and the Awareness–Behavior Paradox

Understanding the divergence between awareness and behavior in digital environments, Dual Process Theory provides a foundational cognitive framework. The theory distinguishes between two interacting systems of cognition: System 1, characterized by fast, automatic, heuristic-based processing, and System 2, characterized

by slower, reflective, and deliberative reasoning (Kahneman, 2011). While System 2 enables individuals to evaluate long-term consequences and regulate behavior consciously, System 1 operates automatically in response to environmental cues. In high-stimulus digital environments, rapid and repetitive cues may disproportionately activate System 1 processing, thereby reducing opportunities for reflective regulation and contributing to persistent engagement despite conscious awareness of risks.

The immersive architecture of digital platforms creates cognitive environments characterized by fragmented attention, continuous exposure to stimuli, and rapid content transitions. Under such conditions, individuals are more likely to rely on heuristic and reactive processing rather than deliberate, reflective evaluation (Kahneman, 2011). Consequently, traditional linear models of decision-making, comprising stages such as recognition, evaluation, and choice, may be compressed into faster, affect-driven cycles of response (Thaler & Sunstein, 2008). Repeated exposure to platform cues further consolidates engagement into habitual loops, as reinforcement within stable contexts gradually shifts behavior from intentional action to automatic routines.

In social media environments, interface features such as infinite scrolling, autoplaying media, and variable-reward notifications (e.g., likes and comments) intensify cognitive load and trigger immediate affective responses, thereby reducing opportunities for cognitive pause and reflective judgment (Zhang, 2024; Thaler & Sunstein, 2008). This structural emphasis on frictionless consumption and social validation provides a theoretical explanation for the awareness–behavior paradox. Even when users consciously recognize the potential risks of excessive screen time, high-velocity, cue-rich environments privilege automatic, stimulus-driven responses over reflective self-regulation (Kahneman, 2011). Persistent engagement, therefore, reflects the dominance of System 1, which may be systematically engaged by platform design, rather than a simple lack of risk awareness.

### 3. Conceptual Framework

This study adopts the Stimulus–Organism–Response (SOR) framework to examine the mechanisms underlying the Awareness–Behavior Paradox in social media use. By structuring the study within the SOR framework, this research systematically examines how platform stimuli relate to internal psychological mechanisms and subsequent behavioral persistence. Within this framework,

- Stimulus (S) refers to platform design features that structure user interaction (infinite scroll, short-form videos, variable reward notifications, personalized feed). These elements represent external environmental inputs encountered during digital engagement and are consistent with persuasive design principles (Fogg, 2009).

- Organism (O) represents internal psychological processes activated in response to these stimuli. These include habit automaticity, reward anticipation, emotional gratification, and perceived value derived from social validation relative to risk awareness.

- Response (R) reflects behavioral outcomes, operationalized as compulsive engagement patterns characterized by time distortion, difficulty disengaging, and continued use despite awareness of potential negative consequences.

Based on the literature review and the Stimulus-Organism-Response (SOR) framework, this study proposes the following hypotheses to deconstruct the mechanisms driving the Awareness-Behavior Paradox. Together, these hypotheses test whether engagement-oriented platform features indirectly contribute to the Awareness–Behavior Paradox through internal psychological mechanisms.

- H1: Platform design features that eliminate stopping cues are positively correlated with time distortion, resulting in session durations exceeding user intention.

- H2: Social validation metrics are positively associated with habit automaticity, functioning as variable reinforcement mechanisms beyond informational utility.

- H3: Emotional gratification mediates the relationship between risk awareness and continued engagement, such that higher emotional reinforcement weakens the protective influence of awareness on behavioral regulation.

## 4. Methodology

### 4.1 Research Design

This study used a quantitative, cross-sectional research design to investigate the structural links among platform design characteristics, internal psychological processes, and obsessive engagement behavior within the context of the Awareness–Behavior Paradox. In order to statistically examine the proposed links resulting from the Stimulus–Organism–Response (SOR) model, a quantitative technique was determined.

### 4.2 Participants and Sampling

The target demographic was university students, as young adults are one of the most prominent demographics of social media users. A non-probability convenience sampling technique was employed to acquire data from  $N = 500$  respondents. A structured survey questionnaire was distributed online to recruit participants. The older age categories had a lesser representation, with the majority of respondents being 18–24 ( $n = 453$ ), followed by 25–34 ( $n = 32$ ). Although generalizability is restricted by the sampling method, it is suitable for exploratory behavioral research that concentrates on structural relationships rather than population estimation.

### 4.3 Measurement Instrument

The survey consisted of 21 items organized into four sections:

1. Demographic and usage patterns
2. Platform design features (infinite scroll, auto-play or short-form videos, notifications, refresh behavior, personalized feeds)
3. Psychological mediators (habit automaticity, emotional impact, social validation, escapism)
4. Paradox-related measures (risk awareness, continued use, and difficulty reducing usage)

All attitudinal and behavioral items were measured using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

### 4.4 Data Analysis

Data were analyzed using PSPP software, a combination of descriptive statistics (means, frequencies), and Pearson correlation analysis. Descriptive statistics (means, standard deviations, and frequency distributions) were computed to summarize participant characteristics and overall response patterns. Pearson correlation analysis was conducted to examine the strength and direction of associations among platform design features, psychological mediators, and behavioral outcomes.

Statistical significance was evaluated at the conventional threshold of  $p < .05$ , with most results significant at  $p < .001$ . To examine the proposed mediation effects (H3), regression-based mediation analysis was conducted following established procedures (Hayes, 2018; Lee et al., 2021). The analysis involved three steps: (1) testing the effect of the independent variable (risk awareness) on the dependent variable (continued engagement), (2) testing the effect of the independent variable on the mediator (emotional gratification), and (3) testing the effect of the mediator on the dependent variable while controlling for the independent variable.

**Table 1** Interpretation of Pearson Correlation Coefficients

<b>r value</b>	<b>Interpretation</b>
.00 – .19	Very Weak
.20 – .39	Weak
.40 – .59	Moderate
.60 – .79	Strong
.80 – 1.00	Very Strong

The significance of the indirect effect was assessed to determine whether mediation occurred. Standardized regression coefficients ( $\beta$ ), t-values, p-values, and  $R^2$  values were reported for each model.

## 5. Results

This section presents the primary objective to examine whether platform design features and internal psychological mechanisms contribute to the Awareness–Behavior Paradox, defined as the coexistence of risk awareness and continued engagement despite recognized negative consequences.

### 5.1 Descriptive Statistics

#### 5.1.1 Usage Patterns

Participants reported diverse social media usage patterns. The most frequently reported platform combinations included TikTok, Instagram, and Facebook ( $n = 70$ ); TikTok, Instagram, Facebook, YouTube, and X ( $n = 57$ ); and TikTok, Instagram, Facebook, and YouTube ( $n = 53$ ). Single-platform usage was most common for TikTok ( $n = 51$ ), YouTube ( $n = 43$ ), Instagram ( $n = 42$ ), and Facebook ( $n = 37$ ). A wide range of other multi-platform combinations was reported at lower frequencies. Daily usage duration ranged from less than 1 hour to more than 5 hours, with the majority of respondents reporting between 2 to 4 hours of daily social media use.

#### 5.1.2 Platform Design Features

Mean scores for platform design features ranged from 3.41 to 3.55 on a 5-point scale. Infinite scroll demonstrated the highest level of agreement ( $M = 3.55$ ,  $SD = 0.94$ ), followed by refresh behavior ( $M = 3.47$ ,  $SD = 1.00$ ) and notifications ( $M = 3.46$ ,  $SD = 1.00$ ), indicating moderate-to-high perceived exposure to engagement-oriented features. When evaluating the relative distribution of mean scores for these platform design features, infinite scroll accounted for the highest proportion (33.0%). Although the differences are modest, infinite scroll had the highest mean score ( $M = 3.55$ ), indicating slightly stronger agreement among participants regarding its association with engagement. The relatively even distribution across features suggests that multiple friction-reducing mechanisms contribute comparably to perceived engagement intensity, rather than reliance on a single dominant design element.

#### 5.1.3 The Awareness–Behavior Paradox

The analysis of survey responses provides empirical insight into the relationship between user awareness and actual social media engagement behavior. Results indicated substantial coexistence of awareness and continued engagement. Nearly half of respondents (49.6%) reported high awareness of social media risks (scores  $\geq 4$ ), while 53.4% reported continued high usage despite such awareness. Notably, 38.2% of participants reported both high awareness and difficulty reducing their usage, highlighting the coexistence of cognitive risk recognition and persistent engagement and supporting the central premise that awareness alone may be insufficient to promote behavioral disengagement in high-velocity digital environments.

### 5.2 Hypothesis Testing

To examine the structural relationships proposed by the Stimulus–Organism–Response (SOR) framework, bivariate correlations were computed among the composite Stimulus, Organism, and Response indices. As shown in Table 1, the Stimulus–Organism correlation was very strong and positive ( $r = .789$ ,  $p < .001$ ), as was the Organism–Response correlation ( $r = .834$ ,  $p < .001$ ). The direct Stimulus–Response correlation was also significant ( $r = .672$ ,  $p < .001$ ). The particularly high association between Organism and Response indices suggests that internal psychological processes (habit automaticity, emotional gratification) are more strongly associated with compulsive engagement than stimulus features alone.

**Table 2** Pearson Correlations among Stimulus, Organism, and Response Variables (SOR model)

Variables	<i>r</i>	Interpretation
Stimulus and Organism	0.789	Strong
Stimulus and Response	0.672	Strong
Organism and Response	0.834	Very Strong



**Table 3 Mediation Analysis Results**

Model Step	Predictor	Outcome Variable	$\beta$	t-value	p-value	R <sup>2</sup>
Step 1	Awareness	Continued Use	0.627	17.833	< .001	0.39
Step 2	Awareness	Emotional Gratification	0.559	13.607	< .001	0.271
Step 3	Awareness	Continued Use	0.516	12.87	< .001	0.423
Step 3	Emotional Gratification	Continued Use	0.198	5.315	< .001	0.423

### H1: Platform Design Features and Time Distortion

Platform design features that eliminate stopping cues showed strong positive correlations with proxies for time distortion. Infinite scroll showed significant positive correlations with habit automaticity ( $r = 0.478, p < 0.001$ ) and reduction difficulty ( $r = 0.449, p < 0.001$ ). Similarly, auto-play features correlated significantly with habit automaticity ( $r = 0.432, p < 0.001$ ) and reduction difficulty ( $r = 0.497, p < 0.001$ ). These findings support H1, indicating that frictionless design features significantly contribute to users losing track of time and exceeding intended usage duration. Data interpretation suggests that platform features are strongly associated with patterns of psychological reinforcement and paradoxical engagement behavior. Thus, the SOR framework is empirically supported.

### H2: Social Validation and Habit Automaticity

Social validation metrics demonstrated the strongest correlations with habit formation. Social validation (likes, comments, views) showed a robust positive correlation with habit automaticity ( $r = 0.543, p < 0.001$ ) and was the strongest single predictor of automatic usage in the study. Emotional impact also correlated significantly with habit automaticity ( $r = 0.453, p < 0.001$ ). Results confirm H2, demonstrating that variable reinforcement mechanisms are strongly associated with the development of automatic usage patterns.

### H3: Mediation of Emotional Gratification

To test H3, a regression-based mediation analysis was conducted to examine whether emotional gratification mediates the relationship between risk awareness and continued engagement. The results indicate that risk awareness is significantly associated with continued engagement ( $\beta = .627, t = 17.833, p < .001$ ), explaining 39.0% of the variance ( $R^2 = .390$ ). Risk awareness was also significantly associated with emotional gratification ( $\beta = .559, t = 13.607, p < .001$ ), accounting for 27.1% of the variance ( $R^2 = .271$ ).

When both risk awareness and emotional gratification were included in the model, both variables remained significant predictors of continued engagement. Risk awareness showed a reduced effect ( $\beta = .516, p < .001$ ), while emotional gratification also had a significant positive effect ( $\beta = .198, p < .001$ ). The overall model explained 42.3% of the variance ( $R^2 = .423$ ).

The reduction in the coefficient for risk awareness, combined with the significant effect of emotional gratification, indicates a partial mediation effect. These findings support H3 and suggest that emotional gratification weakens the regulatory influence of awareness on continued social media usage. The increase in  $R^2$  from .390 to .423 further indicates that including emotional gratification improves the model's explanatory power.

**Note:**  $R^2$  values represent the variance explained by each regression model. In Step 3, both predictors (awareness and emotional gratification) are included in the same model; therefore, they share the same  $R^2$  value.

## 5.3 Platform and Demographic Comparisons

Platform-level comparisons indicated that users of short-form video platforms (particularly TikTok) reported higher mean scores on habit automaticity and paradox-related measures than users of more traditional platforms. This pattern aligns with literature emphasizing the high-velocity and immersive characteristics of short-

form content. Age-group comparisons revealed that participants aged 18–24 reported slightly higher awareness levels, yet also reported greater difficulty reducing usage. This pattern further supports the central premise of the Awareness–Behavior Paradox, indicating that awareness alone may be insufficient to promote behavioral disengagement in highly persuasive digital environments.

#### 5.4 Summary of Results

Overall, the findings provide consistent empirical support for the proposed Stimulus–Organism–Response (SOR) framework and offer clear evidence of the Awareness–Behavior Paradox within the sampled population. Descriptive statistics revealed widespread multi-platform usage and moderate-to-high perceived exposure to engagement-oriented design features. Notably, a substantial proportion of participants simultaneously reported high awareness of social media risks and continued high engagement, illustrating the coexistence of cognitive recognition and behavioral persistence.

Hypothesis testing further clarified the mechanisms underlying this paradox. Platform features that reduce stopping cues, such as infinite scroll and auto-play, were significantly associated with habit automaticity and difficulty disengaging, supporting H1. Social validation metrics demonstrated the strongest association with habit formation, confirming H2 and highlighting the reinforcing role of variable reward mechanisms. Importantly, mediation analysis supported H3, indicating that emotional gratification and social validation processes partially weaken the regulatory influence of risk awareness on continued usage.

Platform and demographic comparisons further revealed that users of short-form video platforms and younger participants exhibited stronger indicators of automatic engagement and paradox-related behavior. Collectively, these results suggest that persistent digital engagement is not solely a function of insufficient awareness but may reflect the interaction between engagement-oriented platform architecture and automatic psychological processes.

Collectively, correlation and regression findings provide strong empirical support for the SOR framework. While platform design features are significantly associated with engagement, internal psychological processes account for substantially greater variance in compulsive usage patterns. Moreover, consistent positive correlations between awareness and continued engagement confirm that cognitive recognition of risk does not necessarily translate into behavioral reduction, reinforcing the central claim of the Awareness–Behavior Paradox.

### 6. Discussion

The findings should be interpreted in the context of a predominantly young-adult sample (aged 18–24), which may limit the generalizability of the results to broader populations. The study provides empirical support for the Awareness–Behavior Paradox in social media usage, demonstrating the coexistence of risk awareness and continued engagement among university students. The findings suggest that persistent digital consumption may not be explained solely by insufficient knowledge of risks, but rather by the interaction between engagement-oriented platform design and internal psychological processes.

The results align with and extend established theoretical frameworks, including the Stimulus–Organism–Response (SOR) model, Dual Process Theory, and reinforcement-based accounts of habit formation. By empirically examining the relationships among platform features, psychological mediators, and behavioral outcomes, the study contributes to a more integrated understanding of compulsive digital engagement.

#### 6.1 The Mechanism of the Awareness–Behavior Paradox

One of the most notable findings was the positive association between awareness of social media risks and continued engagement ( $r = .624$ ). This pattern challenges traditional health behavior models, which typically assume that increased awareness promotes behavioral modification through reflective decision-making. In the digital context, however, awareness alone was not associated with disengagement.

Dual Process Theory (Kahneman, 2011) offers a useful explanatory lens. While reflective processing (System 2) enables users to recognize long-term risks, engagement environments with rapid stimulus presentation

and minimal friction may encourage reliance on automatic processing (System 1). High-frequency content refresh, personalized feeds, and seamless transitions between stimuli reduce opportunities for cognitive pause. Under such conditions, automatic, cue-driven responses may dominate reflective self-regulation among young adults, thereby contributing to the paradox observed in this study. Importantly, this interpretation does not suggest that users are incapable of self-regulation, but rather that environmental conditions may systematically favor habitual over deliberative processing.

## 6.2 Platform Architecture and Habit Reinforcement

The results indicate that platform architecture is a critical factor in reinforcing habitual engagement. Friction-reducing features, including infinite scroll and auto-play, were substantially correlated with habit automaticity. This suggests that design elements that eliminate natural stopping points may facilitate prolonged, unintentional use. These features restrict cognitive pauses that would otherwise enable users to reevaluate their engagement by generating uninterrupted content streams (Fogg, 2009). Behavior may become more reliant on automatic, cue-driven responses rather than reflective decision-making as a result of repeated exposure to frictionless platform architectures that consistently trigger reward prediction errors. Over time, the cognitive effort required to disengage (System 2) outweighs the low-friction ease of continued scrolling (System 1), contributing to the development of persistent habitual engagement patterns. Automatic and reinforcement-based processes may contribute to continued engagement despite users' awareness of negative consequences.

Furthermore, reinforcement-based explanations of digital behavior are bolstered by the robust correlation between habit automaticity and social validation metrics ( $r = .543$ ). Skinner (1953) posits that variable and intermittent feedback, such as unpredictable comments, likes, and views, functions as a potent reinforcement schedule. Due to the unpredictable nature of rewards, users are incentivized to repeatedly verify platforms in anticipation of social validation. This mechanism reinforces habitual engagement, even when users report increased awareness of potential hazards or diminished enjoyment.

These patterns align with the modern discourse on the "attention economy," which involves optimizing platform systems to maintain user engagement (Zuboff, 2019). Despite the fact that the research does not suggest intentional manipulation, the evidence suggests that engagement-maximizing architectures may systematically favor reinforcement dynamics that support persistent utilization. Consequently, habitual engagement may not be exclusively a result of individual predispositions, but rather from the structural configuration of digital environments.

## 6.3 The Role of Emotional Gratification

The mediation study shows that the association between risk awareness and ongoing social media usage is partially explained by emotional fulfillment and social validation. Participants' emotional dependence on social input was positively correlated with their knowledge of potential negative outcomes, which, in turn, was related to persistent participation. This trend implies that the regulating impact of cognitive awareness may be lessened by emotional reinforcement processes. In particular, psychological emotions like stress, social comparison, loneliness, or FOMO may coexist with risk awareness. In these circumstances, people could increasingly rely on the same platforms for emotional support, diversion, or approval. As a result, the platform serves as both an emotional coping mechanism and the source of perceived risk. In this dynamic, when emotional needs are not met in another way, awareness of potential harm does not always serve as a protective factor. These results cast doubt on solely informational theories of behavior modification, which postulate that knowledge growth inevitably results in altered behavior. Rather, the findings highlight the importance of emotional processes and contextual reinforcement in shaping how people engage with digital content. Therefore, in addition to cognitive awareness, interventions that target underlying emotional motives and contextual triggers may be necessary for sustainable behavioral control.

#### 6.4 Theoretical Implications

The present findings contribute to theoretical discussions in behavioral economics by highlighting the contextual limits of rational choice assumptions in digitally mediated environments. Traditional models assume that individuals respond to information by adjusting behavior in a manner consistent with long-term utility maximization (Thaler & Sunstein, 2008). However, the observed positive association between awareness and continued engagement suggests that cognitive recognition alone does not necessarily override reinforcement-driven behavioral patterns. In algorithmically curated environments characterized by intermittent rewards, seamless content transitions, and minimal friction, automatic processing may systematically dominate reflective evaluation.

Furthermore, this study advances the Stimulus–Organism–Response (SOR) framework by empirically validating its relevance to persuasive digital systems. The strong relationships observed among platform stimuli, internal psychological processes, and behavioral outcomes demonstrate that engagement is not merely a function of individual disposition but emerges from the interaction between environmental structure and cognitive-affective mechanisms. By situating digital engagement within the SOR model, this research bridges environmental psychology, reinforcement theory, and dual-process cognition, offering a unified theoretical lens for understanding persistent social media use in contemporary high-engagement ecosystems.

#### 6.5. Practical Implications

The findings have significant consequences for politicians, platform designers, and users. For policymakers, the findings indicate that education-based initiatives, such as digital literacy programs and awareness campaigns, may be ineffective when implemented in isolation. While increasing awareness is important, data suggests that fundamental characteristics of platform architecture have a substantial impact on user behavior. Regulatory frameworks may thus explore implementing design-based protections such as choice-stopping indications, use-visibility dashboards, friction alerts after prolonged use, and opt-in rather than default-enabled systems for limitless scrolling and autoplay. For platform designers, the findings highlight the importance of engagement-oriented design decisions in shaping behavioral outcomes. When features designed to improve user experience and retention are paired with reinforcement dynamics, they can lead to automatic and persistent usage habits. This raises fundamental ethical concerns about the balance between engagement optimization and user well-being. In light of its potential behavioral consequences, the current "attention economy" paradigm, which emphasizes time-on-platform metrics, may warrant reevaluation.

For users, educators, and clinicians, the results suggest that interventions relying solely on willpower or self-control strategies may be insufficient. Because engagement is shaped by both psychological reinforcement and environmental cues, effective strategies may require environmental modifications, such as disabling notifications, setting structured usage limits, or introducing external accountability systems. A comprehensive approach that integrates cognitive awareness with structural and behavioral adjustments may offer more sustainable pathways toward healthier digital engagement.

#### 6.6 Limitations

This study has several limitations that should be acknowledged. First, the research uses a cross-sectional design with self-reported survey data, which limits the ability to establish causal relationships among variables. The findings should therefore be interpreted as associations rather than evidence of causality. Second, while the study draws on theoretical perspectives from neuroscience and behavioral psychology, no direct neurological or biological measurements were conducted. As such, references to reward-related processes and dopaminergic mechanisms should be understood as theoretical interpretations rather than empirical findings. Third, the sample is predominantly composed of young adults aged 18–24 ( $n = 453$ ), which may limit the generalizability of the findings to other age groups. Future research is encouraged to include more diverse demographic groups to enhance external validity.

## 7. Conclusion

This research provides empirical validation of the Awareness–Behavior Paradox in social media use. A notable proportion of participants (38.2%) recognized the hazards associated with excessive social media engagement while grappling to reduce their activity. These results demonstrate that cognitive awareness alone is insufficient for facilitating substantial behavioral change. Persistent engagement appears to be shaped not only by human choices but also by the interaction between engagement-oriented platform features and internal psychological reinforcement mechanisms. The established positive association between awareness and prolonged use ( $r = .624$ ) challenges conventional behavioral theories that posit that information naturally precedes and augments self-regulation. In digitally designed settings characterized by uninterrupted content flow, customized algorithms, and variable social incentives, automatic and reinforcement-based processes may be associated with reduced reliance on reflective decision-making. An individual may persist in these behaviors despite recognizing the potential harms. To create balanced theoretical frameworks and long-lasting intervention strategies, a deep understanding of cognitive mechanisms is necessary to explain how these processes interact with engagement-oriented platform design. Recognizing this interaction is essential to fostering healthier, more independent digital engagement in modern online contexts.

Future research should follow people over time to better understand how social media habits develop, strengthen, or possibly change. Experimental studies can also help determine whether small changes in platform design, such as adding pauses, reminders, or usage summaries, actually affect how people engage. As digital spaces become more personalized and algorithm-driven, it is increasingly important to understand how thinking patterns interact with how these platforms are built. It is important to note that these findings are primarily based on a convenience sample heavily skewed toward university-aged young adults (18-24 years old); therefore, future research should explore whether these paradoxical engagement patterns generalize to older or more diverse demographic populations.

The Awareness–Behavior Paradox highlights the complex relationship between human psychology and persuasive digital technologies. Users are not simply lacking self-control, and platforms are not neutral tools. Rather, digital behavior emerges from the dynamic interaction between individual cognitive processes, emotional needs, and engagement-oriented platform design. Recognizing this interaction is essential for developing more balanced theoretical frameworks and designing digital environments that support healthier, more autonomous engagement.

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