

Designed Captivity: A Study on Attention Capture Mechanisms and User Addiction on Short-Video Platforms

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Abstract: This study analyzes how short-video platforms systematically capture and sustain user attention through interface design, algorithmic recommendation, and feedback mechanisms, thereby inducing addictive behaviors. Integrating design analysis and behavioral psychology theories, it dissects the complete pathway from fluid interactive experience to the formation of neurological tolerance. The study finds that platform architecture fosters user dependence through instant gratification and cognitive restructuring, while design choices under capital logic often neglect individual well-being, leading to social alienation and declined self-regulation. The conclusion emphasizes the necessity to address the ethical responsibility of platform design and strike a balance between technological governance and user autonomy. Interventions should start from the design source to mitigate the social and individual risks caused by excessive immersion.

1. Introduction

In the digital media ecosystem, short-video platforms have profoundly reshaped users' attention allocation patterns through sophisticated interactive design. Focusing on the phenomenon of "designed retention", this paper aims to systematically analyze how built-in attention capture mechanisms of platforms foster and sustain user addictive behaviors. Current research mostly concentrates on technical features or usage behavior descriptions, lacking an integrated analysis that connects design logic, psychological mechanisms, and social effects. From an interdisciplinary perspective, this study combines interface design, behavioral psychology, and communication theories to reveal how platform architecture imperceptibly guides user immersion, thus providing an academic reference for understanding the attention economy and the dilemma of individual autonomy in the digital age.

2. Design of Attention Capture Mechanisms on Short-Video Platforms

2.1 Interface Interaction and Construction of Fluid Experience

The core design philosophy of short-video platforms is to minimize user operation costs and cognitive load through highly simplified interfaces and seamless interactive processes, thereby

maximizing dwell time. Their interfaces generally adopt a full-screen immersive design with extremely streamlined visual elements and interactive controls. Users only need a single finger swipe or tap to complete content switching, liking, commenting, and other diverse operations [1]. This interactive design is not accidental; it is deeply rooted in Nielsen's usability principles and flow theory, aiming to eliminate any potential friction points in user experience. Autoplay, infinite scroll refresh, and streaming content layout without clear termination indicators jointly create a "boundless" browsing experience. Such an experience places users in a passive receiving state imperceptibly, with significantly weakened subjective time perception. The platform successfully shapes itself into an almost exit-free attention container through technical architecture. The fluid experience not only improves users' immediate satisfaction but, more importantly, cultivates an almost unconscious physiological habit for sustained time investment, laying a solid material interface foundation for subsequent cognitive and behavioral dependence [2].

2.2 Personalized Binding of Content Recommendation Algorithms

The effectiveness of platform attention capture mechanisms largely relies on the dynamic binding between machine learning-based content recommendation algorithms and individual user preferences. The mechanism begins with intensive data collection of initial user behaviors, including viewing duration, likes, comments, shares, and even subtle swipe pauses. These data are instantly transformed into multi-dimensional user interest profiles. Based on this, algorithm models continuously predict and push content that users may be interested in through collaborative filtering, deep learning, and other technologies [3]. The subtlety of this process lies in its two-way reinforcement feature: each user interaction refines the profile, and more precise pushes further stimulate user interaction, forming an escalating closed loop. This highly personalized information flow essentially creates a unique "information cocoons" or "filter bubbles" for each user, greatly compressing the diversity and contingency of external information. Users immerse themselves in a comfort zone where their preferences are continuously validated and satisfied, with reduced motivation to explore new content and increased dependence on the current information flow. Personalized binding thus transcends mere technical matching and evolves into a stable and hard-to-break psychological contract, firmly anchoring user attention to the cognitive paths constructed by the platform [4].

2.3 Intermittent Rewards and Uncertain Feedback Settings

Short-video platforms deeply draw on the principles of operant conditioning in behavioral psychology, especially the variable-ratio reinforcement schedule, embedding it into core interactive mechanisms to effectively shape and sustain user habits. Platforms set a series of unpredictable reward nodes, such as the intense pleasure brought by the next video, sudden viral content, notifications of likes and comments from others, or accidentally completed achievement tasks. Rewards are not delivered at fixed intervals or ratios but are full of uncertainty, which is precisely the most effective mode for sustaining behavior—users cannot predict when the next positive feedback will arrive, prompting them to keep swiping to seek rewards. Neuroscience research shows that this uncertain anticipation itself stimulates dopamine secretion in the nucleus accumbens of the brain, generating a sense of craving whose driving force sometimes exceeds the reward itself. Platforms maximize this uncertain feedback mechanism through carefully designed interactive elements, such as hidden progress bars, varied content lengths, nonlinear push sequences, and exploration tags [5]. User behavior is simplified into a rapid cycle of "swipe-anticipate-reward/no reward-swipe again", marginalizing rational decision-making. Behavior gradually shifts to a conditioned reflex driven by subconscious anticipation and craving, which is the key psychological

mechanism leading to the transformation of usage behavior from habitual to addictive.

3. User Psychological Reactions and Pathways to Behavioral Dependence

3.1 Instant Gratification and Reinforcement of Sustained Usage Intention

The primary psychological consequence of the platform's carefully designed interaction and content flow is the continuous provision of high-frequency, low-cost instant gratification for users. Each short-video consumption is essentially a small and rapid emotional or cognitive reward fulfillment, whether for acquiring knowledge, resonating emotionally, or simply entertainment. This instant gratification experience follows the basic principle of "stimulus-response" reinforcement in behaviorism. Each enjoyable viewing equals a positive reinforcement, establishing a stable neurological connection between "opening the platform" and "obtaining pleasure". More importantly, the threshold for obtaining such gratification is extremely low and the path is extremely short, in sharp contrast to the delayed gratification that requires long-term effort in real life. Over time, users' demand threshold for instant feedback keeps rising, while their tolerance for waiting and processes decreases accordingly. This psychological change directly translates into stronger sustained usage intention: When users experience boredom, high stress levels, or brief periods of free time, the brain prioritizes recalling this convenient pathway for pleasure acquisition, thereby triggering usage behaviors without conscious deliberation. The platform therefore successfully shapes itself into the default tool for coping with daily emotional fluctuations and fragmented time. User usage gradually shifts from active choice to a triggered, almost automated response mode [6].

3.2 Cognitive Fragmentation and the Trend of Attention Distraction

In the continuous intake of short-video information flows characterized by seconds-long duration, jumping topics, and loose logical structures, users' cognitive patterns undergo imperceptible adaptive changes, mainly manifested as cognitive fragmentation and declined sustained attention ability. The narrative logic of short videos usually abandons the traditional introduction-development-climax-conclusion structure, pursuing peak emotional or sensory experiences in an extremely short time. This trains the brain to prefer high-intensity, fast-paced stimuli while weakening its ability to process linear, complex, and in-depth information. After getting used to such "information fast food", users' attention is preset with a "fast refresh" rhythm, making it difficult to stay stable in tasks requiring long-term focus, resulting in distracted and wandering attention. Once this cognitive style transfers to in-depth cognitive activities such as learning, working, or reading, it causes significant discomfort and obstacles. Users may find it hard to concentrate, their thinking is easily interrupted, and they lose patience with long arguments. This is not merely "distraction" of attention but "restructuring" of attention-trained by the platform environment into a new state adapted to fragmented input and resistant to in-depth immersion. This trend weakens users' cognitive foundation for critical thinking and creative integration, making them more likely to stay on the surface of information and further deepening their dependence on the platform environment that provides fragmented stimuli.

3.3 Habit Formation and Weakened Self-Regulation Mechanisms

Frequent and reinforced usage behaviors eventually cross the boundary of "intentional behavior" and solidify into an imperceptible daily habit, accompanied by a significant decline in individual self-regulation ability. Habit formation follows the neurological circuit model of

“cue-routine-reward”. The platform perfectly fits this model through notification prompts (cues), user-friendly interfaces (lowering behavioral thresholds), and instant content satisfaction (rewards). With increasing repetition, this circuit is continuously strengthened, and behavioral decision-making gradually shifts from the prefrontal cortex (responsible for rational decision-making and self-control) to the basal ganglia (responsible for automated habits), making usage behavior more unconscious and automated. Meanwhile, users’ self-regulation resources are continuously depleted when facing an environment that provides almost uninterrupted temptations. Every inner negotiation of “just one more video and then stop” and every impulse to resist checking notifications consume limited willpower. When self-regulation resources are exhausted due to sustained temptation resistance or fatigue, behavior is more likely to drift into automatic navigation of habits, leading to unplanned and overtime usage. Platform design, by lowering behavioral initiation costs and increasing the frequency and intensity of temptations, places users’ self-regulation systems under long-term high pressure, eventually causing their defenses to collapse. Habitual usage is consolidated, paving the way for behavior to escalate into addictive dependence.

4. Formation Mechanisms of Addictive Behaviors and Social Impacts

4.1 Neurological Adaptation and Manifestations of Increased Tolerance

Long-term immersion in the high-frequency stimulus environment constructed by short-video platforms leads to adaptive changes in the user’s nervous system, an important physiological marker for the transformation from behavioral dependence to clinical addiction. Similar to tolerance formation in substance dependence, the brain’s reward circuit, especially the dopamine system, undergoes adaptive downregulation in response to sustained and predictable instant pleasurable feedback. This means users need to invest more time, access more or more stimulating content to trigger the same level of pleasure or satisfaction as before. Behind this increased tolerance is the plasticity of neural synapses. The elevated reward threshold makes ordinary stimuli in daily life uninteresting. Users thus fall into a contradictory situation: on the one hand, their dependence on the platform deepens, and usage time increases passively or actively to seek sufficient satisfaction; on the other hand, the actual pleasure efficiency obtained diminishes marginally. This neurological adaptation not only solidifies usage behavior but may also induce withdrawal reactions-when unable to access the platform, users may experience negative emotions such as irritability, emptiness, or anxiety. The existence of tolerance transforms initial recreational usage into a “compulsive” consumption necessary to maintain emotional baseline stability, marking a qualitative change in behavioral patterns.

4.2 Real-Life Social Alienation and Distorted Time Perception

Addictive usage behaviors profoundly erode users’ social relationship structures and subjective spatio-temporal experiences, leading to real-life social alienation and severely distorted time perception. Immersive interaction in virtual space continuously squeezes the time and psychological bandwidth for real-life communication, causing the degradation of complex emotional interpretation, delayed feedback, and in-depth empathy required for face-to-face social interaction due to lack of practice. Users may prefer to seek recognition and connection in online environments while feeling alienated or burdened by family gatherings and friend interactions in real life, forming a “presence in absence”. Meanwhile, the platform’s timeless interface design and fluid immersive experience severely interfere with users’ internal time perception. During continuous swiping, the sense of objective time passing is greatly blunted, and hours may be subjectively perceived as a brief moment. This distortion of time perception not only causes users to lose effective monitoring

of their own behaviors and leads to time management failure but also triggers strong regret and self-denial afterward, further weakening their self-efficacy. The superposition of social alienation and time distortion shifts the focus of users' daily life to virtual space, undermines the performance of real-world roles and social support networks, and exacerbates individual loneliness and risk of social disconnection.

4.3 Analysis of Platform Capital Logic and Ethical Responsibility

User addiction is not merely a technological or psychological phenomenon; its underlying driving force is rooted in the attention economy capital logic on which short-video platforms rely. In the business model where traffic equals profit, user dwell time and interaction data are core monetization assets. Therefore, the inherent economic incentive for platform design optimization and algorithm iteration is to continuously maximize user stickiness and engagement, rather than to protect user well-being or prevent excessive usage. Locking users firmly onto the platform is an inevitable requirement of this business model. This raises a sharp ethical question: when platforms successfully capture and prolong user attention through sophisticated design, even triggering harmful dependence patterns, should they be held responsible for the social consequences of their design, and if so, how? Current practices often individualize responsibility as a “user self-control” issue, which obscures the power of structural design induction. There is a fundamental tension between platform capital logic and healthy user usage. The analysis of ethical responsibility requires transcending simple technological neutrality and facing up to the selectivity of design and the value orientation behind it. It calls on platform operators to shift from pure “growth hacking” thinking to “responsible innovation”, integrating user well-being into core design considerations—for example, introducing transparent time management tools, adjusting addictive interaction modes, and providing a more balanced content distribution mechanism. This is not only a requirement of corporate social responsibility but also a governance issue that the sustainable development of the digital economy must address.

5. Conclusion

Through analyzing the correlation between attention capture mechanisms and user addictive behaviors on short-video platforms, this study points out that platform design continuously shapes and solidifies user immersive experience through multiple means such as algorithmic recommendation, interactive feedback, and reward mechanisms, thereby inducing varying degrees of dependence tendencies. These mechanisms not only reflect the profound intervention of technical architecture in daily life but also reveal the structural constraints faced by individual behavioral choices under the background of the attention economy. Future research should further focus on the differential experiences of different groups in usage and explore feasible paths to mitigate addiction risks from the dimensions of policy regulation and design ethics, so as to promote the protection of human subjectivity and well-being in the digital ecosystem.

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