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Perceived Algorithmic Personalization of Short-Videos and Digital Media Addiction

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Abstract. In the era of mobile internet, short-video services have become a major source of digital entertainment and information for adolescent groups. Short-video platforms rely on algorithm-driven content distribution. Based on users' viewing records, likes, and comments, recommendation systems deliver content matching individual interests and reshape how adolescents receive online information. Meanwhile, many adolescents cannot control their short-video usage, and the problem of digital-media addiction has drawn increasing attention from communication and youth-psychology researchers. This literature review adopts the user subjective-perception perspective. It sorts out the operating logic of algorithm-driven personalized recommendation, defines the concept and real-life manifestations of adolescent digital-media addiction, and discusses the connection between perceived algorithmic personalization and digital-media addiction. The review finds that personalized recommendations improve user experience but strengthen continuous short-video-browsing behaviors through variable-reward mechanisms, raising adolescents' risk of digital-media addiction. Most existing studies focus on objective algorithm functions, while empirical discussions about adolescents' subjective perceptions remain limited. This paper summarizes existing research gaps and offers references for future studies on adolescent media use.

Keywords: Short-video, algorithmic personalization, adolescents, digital media addiction

1. Introduction

With the widespread use of smartphones, short-video media has deeply entered adolescents' daily lives. It serves as an important channel for teenagers to seek entertainment, make social contact, and obtain fragmented information. Short video clips are brief and provide strong sensory stimulation, which fits adolescents' fragmented spare-time patterns and has gained huge popularity among minors. Different from traditional media distribution modes, short-video platforms mainly depend on backend algorithms to select and push content. As a core technical mechanism, personalized recommendation collects large amounts of user interaction data, including viewing duration, completion rates, likes, collections, and forwards. It builds user-interest profiles and realizes "thousands of people, thousands of feeds" content delivery. Users can continuously access preferred content simply by swiping up without active searching, which greatly lowers information-acquisition costs and improves media-use satisfaction [1].

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While these technologies bring convenience, new social risks appear. In recent years, uncontrolled short-video consumption among adolescents has become common. Some teenagers spend large amounts of spare time on short-video platforms. They stay up late watching clips or get distracted by short videos during study time, which harms academic progress, sleep quality, and real-life order. Short-video overuse and digital-media addiction have become important youth-development concerns. Some previous works simply attribute teenage short-video overconsumption to poor self-control and ignore the role of platform algorithm design in forming irrational media-use behaviors. Short-video algorithms are commercially designed to increase user stay time and platform stickiness. Whether such a design promotes teenagers' uncontrolled media use deserves further discussion [2].

A large number of existing papers have analyzed negative mental and cognitive outcomes caused by excessive short-video use among adolescents. Many scholars have also explained the technical principles and social consequences of recommendation algorithms. However, most studies focus on objective algorithm functions rather than users' subjective perceptions. There is still room for research on how teenagers' subjective feeling that "recommended content increasingly matches interests" relates to addiction tendency [3]. Accordingly, this review organizes internal mechanisms of short-video personalized recommendation, explains definitions and real-world harms of adolescent digital-media addiction, explores relationships between perceived personalized recommendation and digital-media addiction, summarizes existing research weaknesses, and puts forward thoughts for future work.

2. Algorithmic personalized recommendation on short-video platforms

2.1. Basic logic of short video recommendation algorithms

Short-video recommendation algorithms are computer systems for filtering, sorting, and distributing massive user-generated content. Every day, short-video platforms receive huge volumes of original user-uploaded videos. Algorithms must match content with users, because platforms cannot push every video to all audiences. Technical details differ across commercial platforms, but core distribution logic is similar. Newly uploaded short videos first enter small-scale traffic pools for testing. Platforms judge content popularity according to completion rates, likes, comment repost numbers, and user stay time. Videos with good performance are sent to larger traffic pools to gain more exposure. Content with poor feedback receives limited traffic distribution [4]. Traffic pool mechanisms form the foundation of short video content distribution and decide which videos reach large audiences.

After content screening, algorithms further complete differentiated content matching for individual users, namely personalized recommendations. Algorithms capture nearly all user interactions inside platforms: clicking videos, watching duration, full view completion, likes, collections, comments, follows, and even fast skips. All these actions are converted into data signals fed into algorithm models.

2.2. Definition and user subjective experience of personalized recommendation

Personalized recommendation means algorithms infer user interest preferences from historical behaviors and deliver differentiated information streams for different individuals [1]. Under traditional mass media environments, audiences receive largely identical content. By contrast, on

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short-video platforms, different users see totally different video lists even if they open the same application.

From the user perception perspective, the most direct experience of personalized recommendation is that "the platform recommended content fits personal interests". When users repeatedly watch videos of one theme, similar content will occupy a larger share in later information streams. Besides pushing clearly preferred content, algorithms insert small numbers of unfamiliar themes to test potential new user interests. Such exploratory pushing aims to discover new preferences and creates content uncertainty. It raises users' expectations for the next clip and encourages continuous screen swiping.

Personalized recommendations have positive values. Users can access interesting content without search effort, and niche interest groups can find matching materials, broadening adolescents' information exposure. However, long-term immersion in algorithm-filtered information streams may produce filter bubble effects. Users' information horizons become restricted within interest ranges judged by algorithms, reducing chances to meet diverse viewpoints [5]. Such continuous interest-aligned content supply reshapes media use habits and creates preconditions for uncontrolled short-video consumption.

3. Digital-media addiction among adolescents

3.1. Definition of digital-media addiction

Digital media addiction belongs to behavioral addiction. Unlike substance-related addiction, it does not depend on chemical intake. It refers to repeated digital-media use accompanied by decreasing behavioral self-control. Users continue media use behaviors even when they clearly realize negative outcomes for study, daily life, and mental state, and cannot easily reduce or stop such behaviors [6]. It is necessary to distinguish high-duration short-video use from digital-media addiction. Some adolescents spend much time watching short videos, but can still adjust usage according to real-world demands and put down phones during study or rest periods. This pattern counts as high-frequency media use rather than addiction. Core judging standards for digital-media addiction are damaged behavioral self-control and real-life functional impairment.

Adolescents belong to high-risk groups for digital-media addiction because of physiological development features. Brain regions responsible for reward sensing and emotional experience mature early, making teenagers highly sensitive to instant sensory pleasure. Nevertheless, the prefrontal cortex region controlling impulse inhibition and rational decision making does not fully mature until the twenties [7]. Such physiological differences make teenagers naturally weaker in self-restraint compared with adults. They are more likely to fall into uncontrolled media use when facing high-intensity instant pleasure from short videos.

3.2. Manifestations and real-world harms of adolescent digital-media addiction

Combined with real-world short-video usage scenarios, adolescent digital-media addiction shows multiple typical manifestations. First, time investment loss of control: large amounts of spare time and even study or sleep time are occupied. Actual usage duration greatly exceeds original plans; many teenagers intend to relax for a short while but end up watching for hours. Second, behavioral control difficulty: users subjectively hope to reduce short-video use but cannot implement this intention. They struggle to close applications, creating conflicts between stopping use willingness and real actions. Third, compulsive use impulses: teenagers uncontrollably open short-video

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software in inappropriate situations, such as class time or homework completion periods. Fourth, withdrawal-related emotional responses: when short-video access is unavailable, users feel irritated, uneasy, or low-spirited and strongly desire to resume browsing. Fifth, real function damage: short-video use disturbs daily schedules, lowers study efficiency, and harms real-world social interaction, vision, and sleep patterns, yet users still fail to cut down usage frequency [8].

When adolescents suffer digital-media addiction or high-risk overuse, negative influences appear in physiological, academic, cognitive, and mental dimensions. Physiologically, late-night short-video watching causes sleep rhythm disorder, and long screen watching harms eyesight. Academically, short videos occupy homework review time, create classroom distractions, and reduce study efficiency.

Cognitively, short videos mostly deliver fragmented, high-stimulation clips. Long-term consumption lowers tolerance for slow-paced deep content. Teenagers show weakened concentration and reduced ability for long-term reading or complex thinking. Mentally, short videos repeatedly activate the brain's dopamine reward circuit. After long-term high-frequency stimulation, ordinary real-life events can hardly bring equal pleasure. Some adolescents further rely on short videos to seek satisfaction and form vicious cycles. Adolescents are building personal value systems. Long-term passive acceptance of an algorithm that pushes fragmented information exposes them to one-sided or emotional content, which obstructs complete rational cognition formation. Existing empirical studies prove that adolescent short-video overuse significantly correlates with sleep disturbance, poor attention, and rising anxiety, highlighting the practical importance of this topic [9].

4. Connections between perceived personalized recommendations and digital-media addiction

4.1. Mechanisms through which personalized recommendations encourage continuous browsing

Personalized recommendations build reinforcement cycles that raise adolescents' digital-media addiction risk. When teenagers open short-video platforms, algorithms keep delivering interest-matched content. Every enjoyable clip brings mental reward feedback. Positive feedback strengthens the "swipe up screen" action, driving users to keep swiping and expecting further pleasure. This creates a repeating loop from the swipe screen to gain reward stimulation and then keep swiping [10].

Traditional video platforms require users to actively select and open videos, and watching naturally ends after one video finishes. Short videos combined with personalized recommendations have no natural stopping signal. Content plays continuously, and users only need mechanical swiping. Algorithms randomly insert unfamiliar themes to produce variable reward effects. Users cannot predict the quality of the next clip. Uncertainty raises psychological expectation. Even after watching uninteresting videos, teenagers tend to keep swiping instead of exiting applications.

From the subjective perception perspective, strong feelings of algorithm content fit improve media use satisfaction and reduce users' motivation to stop browsing. In other words, high-level perceived algorithmic personalization amplifies platform-provided mental rewards, lengthens single-session usage time, and raises chances of uncontrolled browsing, creating conditions for digital-media addiction. However, personalized recommendations work only as a risk factor rather than a decisive cause. Not all teenagers experiencing strong personalized pushes develop digital-media addiction. Digital-media addiction results from multiple interacting factors, including adolescent self-control, emotional status, family education environment, and peer group influence. Perceived algorithmic recommendation represents one external environmental risk variable [3].

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4.2. Review and critical reflection on existing studies

Numerous international and domestic papers discuss relationships among algorithmic recommendations, short-video use, and addiction tendency. Some platform design-oriented studies confirm correlations between infinite scroll patterns, personalized content pushing, and compulsive media use behaviors. Neuroscience-related research suggests variable reward patterns constructed by algorithms activate brain dopamine reward pathways. For adolescents with incompletely developed prefrontal cortex regions, such patterns easily produce behavioral reinforcement effects and raise behavioral addiction risks [11].

Nevertheless, most existing papers focus on objective algorithm functions and objective short-video-use duration. Empirical studies measuring users' subjective perceptions remain limited. Many researchers study objectively output personalized content but rarely explore how strongly teenagers subjectively feel personalized pushing, and how such subjective perceptions predict digital-media addiction. Under identical algorithm information stream environments, different adolescents hold different subjective feelings. Some users clearly notice algorithm-customized content, while others barely sense the algorithm's existence. Individual differences in perception likely affect media use behaviors and addiction tendency, yet empirical evidence on this topic remains insufficient [12].

People should also maintain dialectical viewpoints. Personalized recommendation itself is neutral technology and will not inevitably create digital-media addiction. When adolescents have satisfactory media literacy and can self-regulate usage time, personalized recommendations enrich teenagers' learning and entertainment resources. Risks mainly come from the combination of platform commercial logic (maximizing user stay time) and teenagers' psychological and physiological vulnerability. Most available studies produce correlational results and cannot fully prove direct causal relationships between perceived algorithmic personalization and digital-media addiction. Mediating or moderating variables such as media literacy and emotion regulation ability may exist within such relationships, which deserve further exploration in this research field [11].

5. Research limitations and future directions

Reviewing available literature reveals multiple limitations within studies about short-term personalized recommendations and adolescent digital-media addiction. First, existing papers pay more attention to objective technical dimensions and ignore users' subjective algorithm perceptions. Many works analyze algorithm operating mechanisms and objective use behaviors. Empirical materials about how teenagers understand and feel personalized pushing, and how subjective perceptions influence addiction risks, are still insufficient [3].

Second, heterogeneity within adolescent groups is frequently ignored. Adolescent groups cover upper-grade primary school students, middle school students, and high school students. They show obvious differences in brain development levels, self-control, and media literacy. Many existing studies treat adolescents as one homogeneous group without age group comparative analysis. Strengths of influences from perceived personalized recommendations on addiction tendency may change with age. Generalized whole-group analysis easily hides internal group differences [12].

In addition, short videos include diverse content categories such as entertainment clips, drama episodes, and science popularization material. Different content types bring different psychological stimulation. Most existing papers discuss short-video use in general terms without separating content categories. More grouped studies are needed to test whether the effects of perceived personalized recommendations on media addiction differ across content contexts. Moreover, teenagers hold different usage motivations: some use short videos for relaxation, while others seek

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knowledge. Connections between algorithm perception and addiction may shift under different motivations. Content ecology and platform rules also differ across regions, so existing conclusions cannot be directly applied to all socio-cultural contexts [11].

Based on the above-mentioned limitations, future research can advance in several directions. First, carry out more empirical investigations from the subjective perception perspective. Treat adolescents' perceived algorithmic personalization as a core variable, further clarify interaction paths among perception, media use behaviors, and digital-media addiction, and explore potential mediating and moderating factors. Second, attach importance to internal differences in adolescent groups and launch comparative research for different age groups to identify group-specific influences. Third, conduct subdivided discussions separated by short-video content types and usage motivations. Carry out cross-context and cross-regional comparative analysis to improve the external validity of research conclusions [12]. More abundant empirical work can help society better understand teenagers' media use dilemmas inside algorithm-driven environments and provide theoretical references for guiding healthy adolescent short-video consumption.

6. Conclusion

This review first defines digital-media addiction as a repeated, compulsive pattern of overusing digital platforms that interferes with people's daily life, study, and mental state. Personalized recommendation refers to the algorithm-driven system that analyzes user behavior and continuously delivers content matching individual preferences. From the existing discussion, people can see there is a close connection between these two concepts: personalized recommendation keeps feeding users satisfying content, extends screen time, and raises the possibility for teenagers to develop digital-media addiction.

Nevertheless, several limitations remain within current related discussions. To begin with, teenagers cover a wide range of age groups. Their brain development is in a special stage: their emotional expression ability is well developed, but the self-control system for managing feelings is still immature. Primary school students have not yet formed stable values, while students moving from primary to secondary school are building their worldviews. Many existing works fail to make fine-grained divisions among these subgroups, so they may overlook differences across age stages. Next, short-form videos come in various styles. Many general discussions risk making hasty generalizations, while controlled comparative studies on different video types are still insufficient. Besides, teenagers use short-video platforms for diverse purposes. Some log on mainly to follow celebrities, some for entertainment, and others for information. Since usage motives vary greatly, the path toward addiction is not identical for every user. Many previous analyses do not separate different user groups for targeted exploration. Finally, short-video platforms and local internet environments differ significantly from country to country.

For future research, more attention should be paid to such differences. Researchers could carry out cross-background comparisons across different nations and regions. It would be meaningful to explore how local social and cultural settings shape teenagers' short-video usage, and then figure out practical ways to reduce the risk of digital-media addiction among young populations worldwide.

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