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The Research of TikTok Addiction: An Analysis of Information System Quality and Flow Experience Perspective

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ABSTRACT

Social media addiction is developing as a problem of enormous concern, requiring immediate attention. TikTok is being rapidly used by users, especially adolescents, raising the issue of TikTok addiction. There has been limited research on compulsive behavior with regard to TikTok use. That is, under this notion, this paper proposes a framework that could shed light on both external and internal factors to the addiction behavior of young TikTok users. Under the SOR framework, we develop a causal-chain model for information quality and system quality as the external stimuli, while flow experience is the internal factor accounting for addiction behavior toward TikTok. The SOR framework is an S-O-R model, linked with flow theory, guiding to develop the conceptual model that illustrates the impacts of users' interactions with the TikTok platform on addiction behavior. Thus, the current article throws light on the problem of TikTok addiction among adolescents and offers probable solutions for this general addiction that is devastating society. The next section offers some theoretical and managerial implications..

1. Introduction

As technology continues to advance, the landscape of digital media undergoes constant evolution, shaping the ways in which people communicate and engage with each other (Ngai et al., 2015). Among the array of emerging platforms, short-form video media has emerged as a particularly favored mode of expression and interaction. TikTok, known as Douyin in China, is a major force in the digital arena, with an astonishing 1.5 billion active users worldwide. It has outperformed other well-known platforms like Netflix, YouTube, Snapchat, and Facebook in terms of downloads, according to Omar & Dequan (2020) and Weimann & Masri (2020). Its appeal is particularly pronounced among millennials in China, where it has become the platform of choice for social interaction and content consumption (Jung & Zhou, 2019).

A key factor contributing to TikTok's popularity is its algorithmic prowess, exemplified by the

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"Feed for You" feature. This algorithm is finely tuned to cater to the preferences and viewing habits of its predominantly youthful user demographic, characterized by short attention spans and a penchant for immersive content experiences (Figliola, 2020). By delivering personalized content recommendations, TikTok effectively captures and retains user attention, fostering prolonged engagement with the platform.

As users encounter a steady stream of tailored content, their usage patterns often extend beyond mere casual browsing, leading to deep immersion in the TikTok ecosystem. This immersion is reflected in usage statistics, which reveal that active TikTok users typically access the app multiple times throughout the day, with a significant proportion spending upwards of an hour engaged with the platform on a daily basis (Iqbal, 2020). The beginning of the worldwide COVID-19 crisis and subsequent lockdowns worsened this pattern, as people were restricted to their homes with few opportunities for socializing and entertainment.

During this period, TikTok emerged as a primary source of entertainment and connection for many, with the average daily time spent on the platform skyrocketing to 122.3 minutes—an almost twofold increase from the previous year's figures. At the same time, there was a 19.4% increase in daily active users, highlighting TikTok's significant contribution in meeting the increased demand for social interaction during times of crisis (Iqbal, 2020). Notably, the platform witnessed peak activity between the hours of 9 p.m. and 12 a.m., with a significant portion of its user base logging in during this timeframe (Mou, 2020).

TikTok's meteoric rise to prominence underscores the transformative power of short-form video media in reshaping social dynamics and consumption patterns. Its ability to deliver personalized content experiences, coupled with its ubiquitous accessibility, has solidified its position as a central hub for social interaction and entertainment, particularly among younger demographics. However, as TikTok's influence continues to grow, it becomes increasingly imperative to critically examine its impact on user behavior and well-being, particularly in light of concerns surrounding addiction and excessive usage.

2. Problem Statement

The widespread presence of social media platforms, including TikTok, is a growing concern due to the potential for users to become excessively immersed, attached, and even addicted. This phenomenon has been linked to a range of negative outcomes, from psychological distress to physical health problems. Studies by researchers such as Cao et al. (2020), Weimann and Masri (2020), Beyens et al. (2016), Enez Darcin et al. (2016), Fu et al. (2020), and Weinstein and Lejoyeux (2010) have documented these adverse effects, highlighting the need for awareness and intervention. These adverse outcomes, including depression, anxiety, insomnia, vision problems, academic underperformance, and decreased productivity, align with established indicators of addiction (Gao et al., 2017). Consequently, there's growing recognition that addiction to short-form video apps like TikTok might constitute a specific subset of internet addiction, akin to the recognized phenomenon of Facebook addiction (Zhang et al., 2019).

A significant amount of research has been dedicated to understanding social media use behavior, with scholars like Rahi et al. (2020), Ma et al. (2019), Ifinedo (2018), Idemudia et al. (2018), Zhang et al. (2016), Omar & Dequan (2020), and Liao et al. (2009) mainly examining individual elements such as the technological attributes of social media platforms, the quality of

website design, the perceived usefulness and ease of use, quality of information systems, user satisfaction and attitudes, personality characteristics, and cognitive aspects. In addition, this research often utilizes well-established theoretical models, including the Uses and Gratifications Theory, the Theory of Planned Behavior, Technology Continuance Theory, and Expectation Confirmation Theory, to provide insights into why and how individuals engage with social media.

However, to achieve a more nuanced understanding of user behavior on platforms like TikTok, future research endeavors must adopt a more comprehensive approach. This entails integrating both external factors, such as media characteristics and platform design, and internal factors, encompassing individual user traits and motivations, into their analyses. By incorporating these multiple dimensions, researchers can provide a more holistic understanding of the intricate interplay between users and digital environments, shedding light on the complex mechanisms underlying addiction and other behavioral patterns. This comprehensive approach not only enriches academic discourse but also offers valuable insights for policymakers, educators, and practitioners grappling with the challenges posed by excessive social media usage in contemporary society.

3. Research Questions

This research is structured around the following guiding research questions:

RQ1: How do external factors, specifically information quality and system quality, influence internal factors such as flow experience among TikTok users?

RQ2: To what extent do internal factors, represented by flow experience, impact TikTok addiction behavior among users?

RQ3: Does the relationship between external factors (information quality and system quality) and TikTok addiction behavior significantly mediated by internal factors (flow experience)?

The following form, therefore, the research questions the study aims at answering: the main drivers of TikTok addictive behavior emanating from information quality, system quality, and flow experience. It tries to help in contributing to shedding light on the information quality, system quality, and flow experience pathway that information quality, system quality, and flow experience make of their users' addictive tendency on the platform. The present study will try to add knowledge about the underlying mechanism of the links between external stimuli and addictive behaviors.

4. Purpose of Statement

The main objective of this paper is to construct a theoretical framework elucidating the interconnections among information quality, system quality, flow experience, and addictive behavior within the context of TikTok usage. The integration of these factors into a cohesive model seeks to provide a comprehensive understanding of the mechanisms underlying social media engagement and addiction.

Theoretical support anchors on two important and prolific theories drawn from: the Stimulus-Organism-Response (SOR) paradigm and Flow Theory. The first is used for the conceptualization manner that the various elements of the external stimuli (information quality, system quality) interrelate with the cognitive processes internal (flow experience) and eventually interrelate with the users' behavioral responses (addictive tendencies). The second theory is the theory of flow,

recently introduced to explain the subjective psychological state which takes place upon full engagement in activity and assumes the role of mediator between exogenous stimuli and addictive behavior.

It is noteworthy that despite the proliferation of research on social media usage, there remains a gap in the literature concerning the integration of various factors influencing user behavior into a unified model. By proposing a holistic causal-chain framework, this paper aims to address this gap and offer a more comprehensive understanding of social media use behavior. Such an integrated framework holds the potential to enhance explanatory power and shed light on the complexities of user engagement and addiction in the realm of social media platforms like TikTok. However, further empirical research is warranted to validate and refine the proposed framework, ultimately contributing to a deeper understanding of social media usage behaviors.

5. Literature Review

Recent studies on the TikTok app have mainly explored topics like user engagement (Omar & Dequan, 2020) and its potential to generate business and social benefits, including employment opportunities (Hu, 2020; Xu et al., 2019). Researchers have started to use the Stimulus-Organism-Response (SOR) framework to analyze user behavior through the lens of both internal and external influences. This collection of research frequently points out the negative consequences associated with TikTok use, including depression, anxiety, sleep problems, vision problems, academic challenges, and decreased productivity at work, as indicated by studies from Cao & Sun (2018), Luqman et al. (2017, 2020), Moqbel (2020), and Whelan et al. (2020).

While the SOR model has contributed significantly to the understanding of addiction behavior, some researchers argue that it overlooks the underlying mechanisms contributing to the formation of addictive behavior. In an effort to delve deeper into the factors driving addictive behavior on TikTok within the context of the emerging short-form video medium, this study adopts the SOR model. The study also integrates the Information Systems (IS) model and flow theory into the SOR framework with the aim of coming up with a comprehensive theoretical framework that advances our deep understanding of addictive behavior on TikTok by adolescents.

Drawing upon these theoretical perspectives, this paper will review the existing conceptual framework and propose propositions to further elucidate the complex interplay between internal and external factors in shaping TikTok addictive behavior. By integrating multiple theories and frameworks, this study seeks to provide a more nuanced understanding of the underlying mechanisms driving addictive behavior on TikTok, thereby contributing to the broader body of literature on social media addiction.

5.1 Stimulus-Organism-Response (SOR)

The environment-psychological model, named Stimulus-Organism-Response (SOR) by Mehrabian and Russell in 1974, predisposes that environmental factors are predisposing in nature for people's emotions and cognitive reactions, which later influence their actions (Lee et al., 2018; Mehrabian & Russell, 1974). SOR is one such grand theory for explaining human behavior processes that are put to use in digital environments for making predictions regarding how people make cognitive assessments and decisions to enact resultant behaviors or intentions. This model has been applied across different domains, including consumer behavior analysis, social media usage, immersive digital experiences, and gamification, as demonstrated by the work of Cho et al.

(2019), Kamboj et al. (2018), Sun et al. (2018), Triantoro et al. (2019), and Xu et al. (2019), provides a great prism through which to gain insights into how individuals respond both psychologically and behaviorally in light of different environmental cues, more so when presented by digital media.

In particular, the influence of technological environments and the virtual psychological experiences offered by social networking sites have a profound impact on user behavior, according to Luqman et al. (2017). While platforms offering short-form videos share many features with traditional social media and social networking sites (SNS), they are distinguished by unique attributes. Despite the field of research on these platforms being relatively new, the theoretical foundation laid by prior studies on social media serves as a valuable guide for exploring short-form video platforms like TikTok.

5.1.1 Stimuli: IS Model

The Stimulus-Organism-Response (SOR) model, as outlined by Mehrabian & Russell (1974), identifies stimuli as environmental factors encountered by individuals. Subsequent research, such as studies by Animesh et al. (2011) and Zhang et al. (2015), has examined technological aspects of digital environments as stimuli, highlighting their influence on user experiences. In the Information Systems (IS) domain, the model has been employed by researchers like Benlian (2015) to elucidate how the characteristics of information technology affect users' internal states and subsequently their adoption behaviors.

In the context of this model, the quality of an application is deemed a crucial factor, encompassing two primary aspects: information quality and system quality, as identified by Almahamid et al. (2016). The importance of site quality, integrating both information quality and system quality, plays a pivotal role in shaping users' expectations and perceptions of a site's quality, as discussed by DeLone & McLean (2003) and Liang & Chen (2009). When users interact with online platforms such as TikTok, their impressions are significantly influenced by the provided information's quality and the system's operational efficiency. These quality facets serve as stimuli within the SOR model, thereby affecting users' cognitive and emotional responses, which ultimately influence their behaviors and intentions on the platform.

Information quality involves accuracy, completeness, and relevance of the information contained in a website, presented to the users, which is salient in the user's appraisal of the effectiveness of an Information System (IS) in delivering information relevant to him or her based on his or her experience in using the system. Information quality has to do with the relevance, timeliness, and sufficiency of the data provided (Kim, Sin, & Kim, 2003). It relates to the quality of information to be found at the site of the IS and will, therefore, require the features that make it personal, complete, relevant, easy to use, and secure enough for interaction online (DeLone & McLean, 2003).

In recent research, the IS success model has been applied to analyze user behavior on mobile platforms. Gao and Bai (2014) employed this model to explore the ongoing engagement of users with mobile social networking services, finding a direct link between the quality of information and users' experiences with these services. This discovery emphasizes the importance of information quality in influencing user perceptions and actions within the realm of mobile social networking, pointing out its vital role in enhancing user experiences and encouraging continued use of digital platforms.

System quality is characterized by the effective functionality of website features, including accessibility, reliability, and response speed, as highlighted by DeLone & McLean (2003). It showcases a website's technical prowess in providing its users with fast and seamless access to data, maintaining both reliability and security, a point further elaborated by Teo et al. (2008). Essentially, a well-designed system serves as a cornerstone for business benefits, such as cost reduction, improved process efficiency, and increased profits. Conversely, a system that is poorly designed can disrupt business operations, leading to increased product costs and operational inefficiencies, as observed by Ghasemaghaei & Hassanein (2015) and Gorla et al. (2010).

5.1.2 Organism: Flow Experience

In the Stimulus-Organism-Response (SOR) model, the 'organism' component is described as encompassing the cognitive and emotional intermediary states that mediate the relationship between environmental stimuli and individual responses, according to Mehrabian & Russell (1974). Gao and Bai (2014) delve into the 'organism' aspect, interpreting it as the mental assessment customers make during their online shopping experiences, which is perceived as a dynamic interaction flow. This examination further incorporates the concept of 'flow' into the 'organism' dimension. 'Flow' is characterized as a state of deep engagement and intense concentration, serving as a crucial intermediary that influences users' cognitive and emotional reactions to digital stimuli. By integrating 'flow' within the 'organism' segment of the SOR model, the research aims to elucidate the intricate dynamics between users' internal experiences and their perceptions and behaviors in response to external stimuli encountered on platforms like TikTok.

The SOR model is a conceptual platform that further explicates how the experiences of flow act as a mediator. For example, some previous studies point out that in the SOR model, the effect of external stimulation may impact consumers' behavior response, or it may be mediated by consumers' internal states (organism) (Gao & Bai, 2014; Ha & Lennon, 2010). Users most often reach a psychological flow state in the computer-mediated communication environment, as pointed out by Lee et al. (2018).

Flow theory, introduced by Csikszentmihalyi in 1975, describes a state of profound immersion characterized by an optimally enjoyable psychological experience, as detailed by Novak, Hoffman, and Yung in 2000. In this condition, known as flow, individuals become intensely absorbed in their activities to the extent that they become unaware of time and their immediate environment. This state of flow is identified as a key motivator for continued engagement in activities, as suggested by the findings of Chang (2013) and Khang & Woo (2013).

Given that short-form video applications offer an experiential product, the value for users primarily arises from their experiences during the usage process, often resulting in significant enjoyment. Thus, building upon the SOR model and previous research on the mediating effects of internal cognitive states, it is reasonable to hypothesize that flow, within the context of information system quality, acts as an intermediary between user reactions and affects their internal mental processes, subsequently influencing their behavioral responses. Therefore, employing flow theory to investigate the addictive behavior of users on short-form video applications represents a promising avenue for research.

5.1.3 Response: TikTok Addiction Behaviour

Within the Stimulus-Organism-Response (SOR) model, the 'response' element is concerned with the outcomes, actions, or reactions that are prompted by the stimuli and filtered through the

organism. This response may include a range of psychological reactions, like attitudes or behaviors, which Mehrabian & Russell (1974) further distinguish into approach and avoidance behaviors. Approach behavior signifies a positive reaction, suggesting an inclination towards something, whereas avoidance behavior represents a negative reaction, indicating a tendency to steer clear of something.

Recent advancements in algorithmic technology have enabled platforms to deliver more tailored content to users, leading to varying levels of immersion and, consequently, inducing addictive behavior. Within social media environments, users are exposed to a multitude of technical features or functions, including user-generated content, technical stress, fatigue, and user profiles, all of which influence users' engagement with the platform. As noted earlier, behavior on social networks is closely intertwined with users' psychological experiences (Zhang et al., 2016).

TikTok, a rising platform for short-form videos, delivers content tailored to the individual tastes of its users. Its engaging features and personalized content have a particularly strong appeal to younger audiences, offering a form of addictive entertainment. As a result, addictive tendencies can be seen as a reaction to the engaging experiences provided by short-form video applications on smartphones. This behavior is characterized by users spending more time and engaging more deeply with the platform, a trend fueled by the compelling and customized content that TikTok provides.

6. Proposition Development

6.1 Information System Quality to Flow

Based on previous research findings, such as those by Zhou et al. (2010) and Jung et al. (2009), it is evident that information quality significantly impacts users' flow experience, which subsequently influences user loyalty. Additionally, Zhou (2014) verified that the quality of both the system and the information significantly influences users' experiences of flow on mobile internet sites.

TikTok offers a unique experience in the social media space, with its various filters, special effects, stickers, and editing tools, as well as by drawing on user content created elsewhere that it offers in a personalized “For You” feed. The result, for many users, is an endless parade of things they find compelling — even though they understand they probably shouldn’t. That’s perhaps especially true for the younger users who, lacking real self-control of their own, are at “tractable” to begin with.

Given these insights, this study posits that the positive perceptions of information quality and system quality provided by TikTok facilitate users' immersion in the platform and subsequently foster a flow experience. Consequently, it becomes easier for users, especially teenagers, to become addicted to short-form video apps like TikTok.

Based on these premises, the following propositions are derived:

Proposition 1: Information quality positively influences user flow experience.

Proposition 2: System quality positively influences user flow experience.

6.2 Flow to TikTok Addiction

Recent research findings, including Chou and Ting's (2003) work that found a significant association between flow and online game addiction, as well as research indicating that individuals using smartphones were likely to experience flow while doing such things as playing games or browsing the internet (Joo, 2016; Kim & Han, 2014), it is evident that flow can have both positive and negative outcomes. Specifically, when individuals seek to attain a positive flow experience, they may become more susceptible to addiction to media platforms (Salehan & Negahban, 2013).

Based on this comprehension, the study suggests that the experience of flow might also affect the compulsive usage of short-form video applications such as TikTok. It is hypothesized that individuals who experience flow during their engagement with TikTok are more likely to exhibit addictive behaviors. This proposition aligns with previous research indicating that flow may serve as a precursor to addictive behavior (Khang et al., 2013), suggesting that the immersive and engaging nature of flow experiences on TikTok may contribute to users' propensity for addictive usage patterns.

Therefore, based on these premises, the following proposition is raised:

Proposition 3: Flow experience has a positive influence on TikTok addiction behavior.

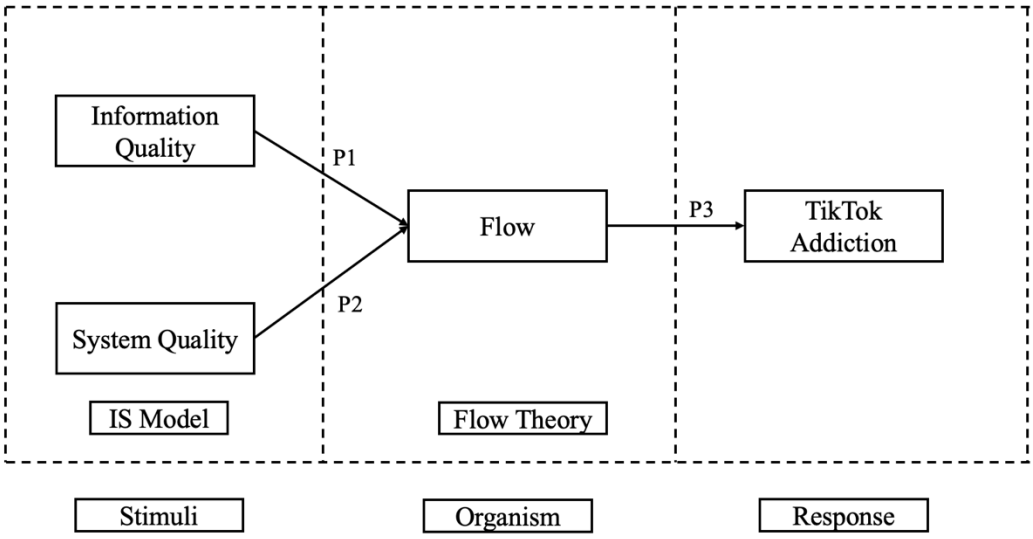

Figure 1 Theoretical Framework

The rest of this document will explore in depth the foundational theories behind the SOR model, Information Systems (IS) theory, flow theory, and the concept of addictive behavior. These theoretical frameworks will be thoroughly explained to offer an in-depth understanding of their importance in researching addictive behaviors on platforms such as TikTok.

Following this, the study introduces a conceptual framework that combines elements from the Stimulus-Organism-Response (SOR) model, Information Systems (IS) theory, flow theory, and theories of addictive behavior. This framework forms the theoretical foundation for exploring how various internal and external factors contribute to addictive behavior in users of short-form video applications, with a specific focus on TikTok.

Furthermore, three propositions derived from the conceptual framework will be introduced

and elaborated upon. These propositions delineate the hypothesized relationships between specific factors, such as information quality, system quality, flow experience, and TikTok addiction behavior. Through the examination of these propositions, the study aims to shed light on the complex interplay between internal and external factors in shaping addictive behavior in the context of short-form video apps.

Overall, by synthesizing insights from multiple theoretical perspectives and proposing testable propositions, this paper endeavors to advance our understanding of addictive behavior on TikTok and similar platforms, thereby contributing to the broader discourse on social media addiction.

7. Research Methods

The paper outlines a framework aimed at understanding TikTok addiction behavior and proposes several research propositions for empirical validation. To statistically validate the conceptual model, it is essential to gauge users' perceptions of information and system qualities, as well as their experiences with flow and addictive behavior. A survey research method is deemed most suitable for this purpose, aligning with past research methodologies employed in examining TikTok usage behavior (Omar & Dequan, 2020).

Regarding the selection method, the focus is on adolescents or young people, who constitute a considerable segment of TikTok's user base. A possible group for this research could include teenagers aged 14-18 who have engaged with TikTok over the previous year. Techniques like virtual snowballing or network sampling, which are non-probability methods, could be employed to connect with TikTok users through online channels.

For the measurement of different constructs, items from previous studies could be adopted. To evaluate information quality and system quality, the research conducted by Kim et al. (2003) and Zhang et al. (2016) could serve as a reference. Similarly, to assess the flow experience, the methodologies employed by Zaman et al. (2010) and Zhang et al. (2014) might be utilized. Additionally, to explore TikTok addiction behavior, the approaches described in the studies by Kim et al. (2003) could be applied.

In the examination of the data, it is recommended that the model under consideration be assessed through the use of partial least squares structural equation modeling (PLS-SEM), as advocated by Hair and colleagues in 2019. This method is particularly advantageous for the exploration of complex and causally defined models, rendering it an exceedingly suitable technique for the evaluation of the specified interrelations among the constructs within the theoretical framework. Pursuant to Hair et al.'s (2019) suggestions, the analysis of the study model should proceed in two stages. Initially, the measurement model is scrutinized to confirm the survey's validity and reliability. Subsequently, in the second stage, the structural model undergoes examination, where the posited research hypotheses are subjected to testing through bootstrapping methods. This comprehensive analytical approach lays a robust foundation for the scrutiny of the conceptual model, thereby affirming the research hypotheses proposed in the investigation.

8. Data Analysis

8.1 Measurement Model

The reliability of internal consistency was assessed using Cronbach’s alpha and composite

reliability measures. The findings indicated adequate internal consistency of the model, as evidenced by Cronbach's alpha and composite reliability scores exceeding 0.7 (Henseler et al., 2015). Furthermore, indicator reliability was confirmed to be satisfactory with outer loadings greater than 0.6 (Chin, 1998), and convergent validity was achieved, as shown by average variance extracted values higher than 0.5 (Fornell & Larcker, 1981). These findings are detailed in Table 1.

Additionally, the Heterotrait Monotrait (HTMT) method was utilized to evaluate discriminant validity (Henseler et al., 2015). The findings indicated that none of the constructs crossed the HTMT0.85 limit, thus affirming the discriminant validity was secured (Henseler et al., 2015). The results conforming to the specified criteria are displayed in Table 2.

Table 1 Results Summary for the Constructs

Uni-dimensional Constructs					
Constructs	**Items**	**Indicator Reliability**	**Internal Consistency Reliability**		**Convergent Validity**
		Outer Loadings	CA	CR	AVE
		>0.60	>0.7	>0.7	>0.5
Information Quality	IQ1	0.679	0.899	0.867	0.672
	IQ2	0.807			
	IQ3	0.796			
System Quality	SQ1	0.896	0.782	0.776	0.782
	SQ2	0.779			
	SQ3	0.723			
	SQ4	0.718			
Flow	FL1	0.724	0.891	0.823	0.678
	FL2	0.856			
	FL3	0.754			
TikTok Addiction Behavior (TAB)	TA1 / TA11	0.887 / 0.778	0.881	0.878	0.633
	TA2 / TA12	0.784 / 0.876			
	TA3 / TA13	0. 762/ 0.812			
	TA4 / TA14	0. 971/ 0.832			
	TA5 / TA15	0. 863/ 0.854			
	TA6 / TA16	0. 886/ 0.871			
	TA7 / TA17	0. 812/ 0.823			
	TA8 / TA18	0. 756/ 0.912			
	TA9 / TA19	0. 845/ 0.782			
	TA10 / TA20	0. 892/ 0.723			

Table 2 Discriminant Validity: Heterotrait Monotrait (HTMT) Criterion

	Information Quality	System Quality	Flow	TikTok Addiction Behaivor
Information Quality				
System Quality	0.791			
Flow	0.747	0.731		
TikTok Addiction Behavior	0.242	0.435	0.231	

8.2 Structural Model

Following the approach suggested by Hair et al. (2021), the examination of path relationships was conducted using 1,000 bootstrap samples and employing a one-tailed test at a significance level of 0.01. The outcomes of the PLS-bootstrapping are documented in Tables 3.

Table 3 presents the results of statistical tests for direct relationships between variables in a research study. The table includes results for three path relationships. The first is Information Quality (IQ) to Flow (FL), with a path coefficient of 0.231, a standard deviation of 0.045, a T statistic of 2.994, and a P-value of 0.000. This indicates statistical significance at the $p<0.01$ level, with bootstrapped confidence intervals ranging from 0.037 to 0.289 at the 1% and 99% levels, respectively, leading to the acceptance of the hypothesis. The second path from System Quality (SQ) to Flow (FL) shows a coefficient of 0.193, a standard deviation of 0.053, a T statistic of 5.463, and a P-value of 0.000, with bootstrapped confidence intervals of 0.129 to 0.330, also resulting in an accepted hypothesis. The final hypothesis tested the relationship from Flow (FL) to TikTok Addiction Behavior (TAB) and returned a path coefficient of 0.211, a standard deviation of 0.059, a T statistic of 2.034, and a P-value of 0.000, with confidence intervals between 0.035 and 0.259, leading to acceptance.

Table 3 Direct Effect Hypotheses

Hypothesis					**Bootstrapped CI**	**BC**	
Variable Relationship	**Path Coefficient Beta (β)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	***P* Values**	**1% LL**	**99% UL**	**Decision**
IQ -> FL	0.231	0.045	2.994	0.000	0.027	0.278	Accept
SQ -> FL	0.193	0.053	5.463	0.000	0.136	0.341	Accept
FL -> TAB	0.211	0.059	2.034	0.000	0.032	0.341	Accept

***Notes**: Significant at p<0.01**, IQ->Information Quality, SQ->System Quality, FL->Flow, TAB->TikTok Addiction Behavior*

9. Conclusion

In conclusion, this study advances our comprehension of TikTok addiction among adolescents by constructing a comprehensive framework that integrates the Stimulus-Organism-Response (SOR) model with Information System quality and flow theory. Through empirical analysis, it

confirms that both information quality and system quality significantly impact users' flow experience, which in turn, fosters TikTok addiction behavior. This study not only enriches the theoretical landscape of digital media addiction but also offers practical implications for developers, policymakers, and educators seeking to mitigate the negative effects of social media overuse.

Our findings underscore the importance of creating a balanced digital environment that promotes healthy usage patterns, especially among younger users. By implementing features that encourage responsible use, social media platforms like TikTok can contribute to the well-being of their user base, while also sustaining engagement in a positive manner.

9.1 Theoretical Implications

Theoretical contributions of this study are multifaceted and significant for media literature. Primarily, it substantiates the applicability of the Stimulus-Organism-Response (SOR) model within the context of TikTok addictive behavior, thereby enhancing the theoretical framework within media studies. By demonstrating that both internal factors (flow experience) and external factors (Information System quality) can precipitate adolescents' addiction to TikTok, this research provides robust empirical evidence that enriches our understanding of addictive behavior in digital media environments.

Furthermore, this research enhances the existing knowledge of adolescent addiction to TikTok by incorporating factors of Information System quality and flow into an adapted SOR model (Belk, 1975). Traditional studies in the area of social media have mainly utilized theories like the Theory of Planned Behavior (TPB), Technology Continuance Theory (TCT), and Expectation Confirmation Theory (ECM), focusing largely on factors at the individual level and neglecting the influence of external environmental stimuli. This study fills this void, offering a broader and more detailed perspective on TikTok addiction behavior, thus contributing significantly to the literature.

Furthermore, the integration of internal factors (flow) and external factors (Information System quality) within the modified SOR model represents a novel approach to examining the relationship between information systems, flow experiences, and addiction behavior. This approach transcends the limitations of previous studies and offers a more holistic perspective on the multifaceted nature of addictive behavior in digital media environments.

Therefore, this study makes significant theoretical contributions by validating the SOR model in the context of TikTok addiction behavior, integrating internal and external factors within a modified theoretical framework, and advancing our understanding of adolescent addiction behavior in digital media platforms.

9.2 Practical Implications

The practical implications of this research are profound, particularly in addressing the pressing issue of social media addiction among young users, specifically on platforms like TikTok. Excessive immersion in media platforms can actively trigger addictive behaviors among adolescents, potentially leading to detrimental effects such as depression and anxiety. This not only poses legal liabilities and ethical concerns for TikTok operators but also underscores the responsibility of scholars and practitioners to mitigate these risks and promote healthy social media usage habits among users.

Considering that adolescents are at a pivotal stage of growth, it is vital for media operators to

promote healthy digital habits instead of contributing to the development of addictive behaviors. Therefore, it is imperative for operators to implement measures aimed at curbing addictive behaviors and promoting responsible usage. For instance, implementing features such as an adolescent mode that limits the content accessible to young users and controls the duration of their usage through reminders or disconnection systems has been shown to be effective in managing addictive behaviors (Chen et al., 2017).

By adopting such strategies, TikTok operators can fulfill their ethical obligations to safeguard the well-being of their users, particularly adolescents, and mitigate the negative consequences associated with social media addiction. Additionally, these measures can contribute to building a safer and healthier digital environment, fostering positive user experiences, and enhancing the overall societal impact of social media platforms. Thus, the practical implications of this research extend beyond academia, offering actionable insights for policymakers, industry stakeholders, and practitioners to address the challenges posed by social media addiction effectively.

9.3 Limitation and Future Research

While this article offers diverse theoretical and practical implications, it is important to acknowledge its limitations, which pave the way for future research endeavors. Firstly, the conceptual framework and propositions proposed in this study necessitate empirical validation. However, the current global epidemic has significantly altered the daily routines and behaviors of TikTok users, potentially exaggerating the effects of addiction due to increased smartphone usage at home. Therefore, subsequent empirical research should prioritize testing the proposed theoretical model under more normal circumstances to ensure the generalizability of findings.

Secondly, addiction formation is a complex phenomenon influenced by various psychological, social, and environmental factors. Relying solely on quantitative methods may limit the depth of understanding and potentially introduce research bias. Future studies should consider adopting a mixed-methods approach, combining qualitative and quantitative methodologies. Qualitative methods, such as interviews or focus groups, can provide insights into the nuanced experiences and perceptions of users regarding short-form video application addiction. This combined approach would offer a more comprehensive understanding of the underlying mechanisms and dynamics of addiction behavior, enriching the overall body of knowledge in this area.

By addressing these limitations and incorporating both empirical testing and methodological diversity into future research endeavors, scholars can further advance our understanding of short-form video application addiction behavior and develop more effective interventions and strategies to mitigate its negative consequences.

Data Availability Statements

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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