

"Digital pain relief" or "digital hallucinogen": a study on the impact mechanism of short video usage intensity on loneliness

Yirui Zhang

School of Culture and Communication, Capital University of Economics and Business, Beijing, China

z0601281124@163.com

Abstract. With the rapid development of the Internet, short videos have become deeply embedded in people's daily lives, and users' reliance on them has been steadily increasing. At the same time, the negative impacts brought by technological advancements, such as the deepening of loneliness, are increasingly recognized and are causing growing concern among more users. This paper employs a literature review to analyze existing studies on short video use, finding that they predominantly employ single-effect models, either from a positive or negative perspective. Building on existing research, this study aims to extend the exploration by examining the mechanisms underlying the impact of real-life social inhibition and Parasocial Interaction (PSI) on emotional and social isolation among short video users, using a competitive mediation model. It reveals the double-edged sword effect of the algorithm recommendation mechanism, providing empirical evidence to better design "anti-addiction" features for platform operators and digital health tips for users. Additionally, it helps users promote reflective use of short videos and enhance their media literacy.

Keywords: short video usage, real-life social inhibition, parasocial interaction, loneliness, competitive mediation model

1. Introduction

In the context of the rapid development of the Internet, short videos have become increasingly popular and widely available. According to the *China Online Audio-Visual Development Research Report (2025)*, by December 2024, China had 1.04 billion short video users (93.8% utilization), each spending an average of 156 minutes per day [1]. Short videos have become deeply integrated into people's daily life scenarios. Although they enable audiences to obtain information more efficiently and conveniently and provide users with certain entertainment, their negative impacts cannot be ignored. Issues such as loneliness, anxiety, and attention deficit caused by excessive use have become increasingly prominent, directly affecting people's physical and mental health. Therefore, the public health sector has responded by implementing policies, and the National Health Commission has included "internet addiction" within its scope of governance for adolescent health issues. This policy indicates that the use of short videos has now become a public health issue.

Existing research on the impact of short videos primarily adopts two perspectives: the positive perspective see short videos as an efficient, intuitive medium that benefits college students by providing rich information and entertainment [2]. The negative perspective focuses on addiction, analyzing it from cognitive, emotional, and behavioral motivations, and calls for better media literacy, addiction prevention, and stricter regulations [3].

However, existing research often adopts a single-effect model, examining either positive or negative impacts, and fails to explain why the same behavior can yield vastly different effects across individuals and over time. Therefore, this study aims to systematically compare the "pain-relieving" and "hallucinatory" mechanisms of short videos within the same model, using a competitive mediation model to explain the impact mechanism of virtual companionship and the dual paths by which crowding out real-life social interactions increases loneliness. Unlike traditional media dependency theory, which focuses on users' dependence on information content, this study reveals users' dependency on Parasocial Interaction (PSI), in which users project emotional needs onto algorithmically recommended virtual subjects. Using uses and gratifications theory, the study explains the motivation behind high-intensity short video use. The competitive mediation model accounts for the different effects, forming a coherent "motivation to behavior to consequences" chain.

2. Literature review

2.1. Theoretical framework

2.1.1. *Uses and gratifications theory*

The theory of use and gratification, proposed by Elihu Katz, focuses on the process by which audiences actively choose media to satisfy their needs, emphasizing individuals' agency in communication [4]. Katz believes that the media contact behavior of audiences follows a causal chain model of "social psychological factors - demand generation - media expectations - media use - demand satisfaction". The types of demand encompass multiple dimensions such as cognition, emotion, and social integration. This theory posits that audiences do not passively receive information but actively choose and use media content to satisfy their diverse needs. This process of actively selecting media based on specific needs fully explains the starting point of high-intensity short video usage: users actively seek emotional companionship, social recognition, stress relief, and other satisfactions, and the degree of satisfaction of these needs will affect the continuation and deepening of usage behavior.

2.1.2. *Media dependency theory*

Media dependency theory posits that an individual's degree of dependence on media is determined by the media's ability to fulfill their needs within a specific social context [5]. The higher the audience's dependence on media, the more pronounced the influence of media on their cognition, attitudes, and behaviors becomes. This theory offers an explanatory perspective on cost for this study: people's high dependence on short videos subtly affects their cognition and attitudes towards real-life social interactions, thereby impacting real-world social functions.

2.1.3. *Parasocial Interaction theory (PSI)*

The concept of PSI was proposed by sociologists Horton and Wohl in 1956, initially used to describe the relationship between television viewers and media figures [6]. With the popularization of the Internet, its research has expanded to areas such as social media, live streaming, virtual idols, and Artificial Intelligence (AI). In the digital media era, the one-way emotional connection and its psychological mechanism established

between audiences and media figures have further evolved into quantifiable interaction patterns. This pattern is particularly evident in the interaction between fans and bloggers. Existing research indicates that PSI can, on the one hand, provide users with virtual companionship compensation, alleviating real-life loneliness. On the other hand, it may lead to users' excessive dependence on virtual relationships, weakening their willingness and ability to engage in real-life social interactions, and exacerbating social isolation. This theory provides an important analytical framework for this paper to explore how the use of short videos affects users' emotional and social loneliness through the PSI pathway.

2.2. Hypothesis

Existing research from social psychology and communication studies has confirmed that addiction to short videos can exacerbate loneliness, providing a theoretical basis for this study to examine the significant impact of short video usage intensity on loneliness [7]. Based on the competitive mediation model, this study explores the influence mechanisms of "real-life social inhibition" and "parasocial interaction" on emotional loneliness and social loneliness. The intensity of short video usage may either increase loneliness by crowding out real-life social time or alleviate loneliness by providing virtual companionship. Therefore, the following hypotheses are proposed:

H1: The intensity of short video usage has a significant impact on college students' loneliness.

H2: Real-life social inhibition plays a positive mediating role between the intensity of short video usage and loneliness.

H3: Parasocial interaction mediates the relationship between the intensity of short video usage and loneliness.

3. Research design

3.1. Research methodology

The study employs a questionnaire survey to quantitatively measure the intensity of short video usage and its impact on emotional and social isolation through two competing pathways: real-life social inhibition and PSI. The survey targeted college students via an online platform. After excluding invalid questionnaires with too short response times and those with patterned responses, 106 valid questionnaires were obtained, with a reasonable demographic distribution. Attention-check items were included to ensure data quality.

3.2. Questionnaire design

This study involves four core concepts: short video usage intensity, PSI, real-life social inhibition, and loneliness. All variables except loneliness use a 5-point Likert scale:

Short video usage intensity: It encompasses four dimensions: behavioral intensity, time investment, scene penetration, and compulsive characteristics. Specifically, it includes daily average usage duration, daily average opening frequency, number of typical usage scenarios, and reductions in feelings of loss of control and withdrawal reactions during usage. Measurement indicators are formed through self-designed options to reflect users' dependence on and usage intensity of short videos.

Parasocial interaction: Utilizing a self-developed scale. This encompasses indicators such as identity recognition and emotional attention, commencing from the perspective of "directionally attentive" users, to assess the quality of PSI between users and virtual entities.

Real-life social inhibition: A self-developed scale capturing crowding out of real-life social time, active avoidance, distracted attention, deterioration of social skills, priority downgrading, and loss of real-life relationships.

Loneliness: The UCLA Loneliness Scale, distinguishing emotional loneliness (lack of intimate emotional connection) and social loneliness (lack of social belonging). A 4-point Likert scale is used.

3.3. Model design

This study is conducted based on the model diagram shown in Figure 1. The model specifies that short video usage intensity influences loneliness through two parallel mediators: real-life social inhibition and Parasocial Interaction (PSI).

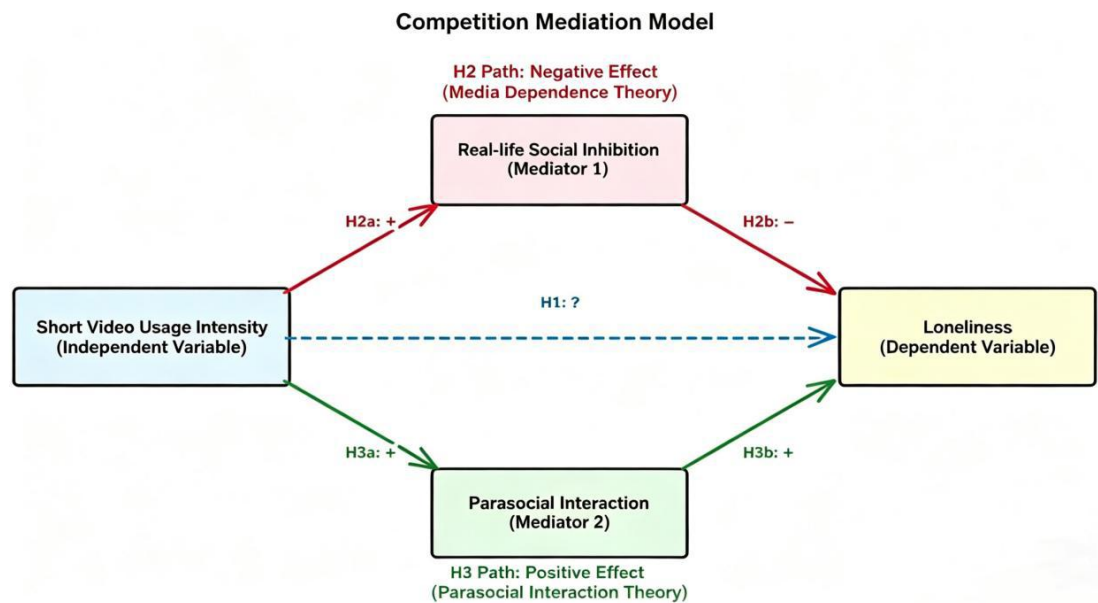


Figure 1. Competition mediation model

3.4. Reliability and validity test

All scales showed good internal consistency in this sample. Reliability analysis using SPSS, which includes Cronbach's α coefficients of 0.829 (PSI), 0.602 (real-life social inhibition, acceptable range), and 0.870 (loneliness).

4. Results

4.1. Descriptive statistics of demographic variables

The gender distribution of the effective samples in this survey is balanced, with males accounting for 48.11% and females for 51.89%. Most samples are concentrated in the youth group aged 21-26, with 34.91% aged 21-23 and 31.13% aged 24-26, accounting for over 60% in total. Smaller proportions are aged 18-20 (13.21%) and 27-28 (20.75%). Living status shows most live alone (40.57%), followed by those with a partner (24.53%), roommates (19.81%), and family (15.09%). This sample background supports later analysis of factors affecting loneliness. The distribution of sample living status is shown in Figure 2.

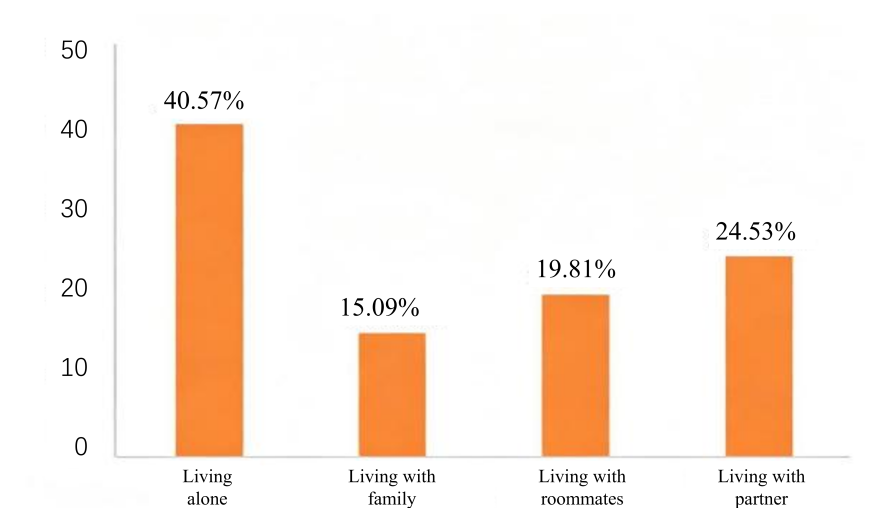


Figure 2. Distribution of sample residence status

4.2. Descriptive statistics of short video platform usage

4.2.1. Differences in platform usage

Practical results show that there is no significant difference in the usage proportions of users across different genders on mainstream short video platforms, and the usage proportions across platforms are relatively close. In terms of age, young users aged 18-20 have a significantly higher preference for TikTok than users in other age groups, with a usage rate as high as 92.86%. Meanwhile, the usage rate of Kwai among this age group is only 28.57%, which is significantly lower than that of other age groups.

4.2.2. Usage behavior and dependency features

The usage behavior and dependency characteristics of short videos are shown in Table 1. Most users exhibited medium-to-high intensity usage: over 60% used short videos for 2 hours or more daily, and nearly 70% opened the app 20 or more times per day. Active search for specific bloggers was common (84.91%), while a notable proportion (47.17%) also consumed a high share (50–80%) of algorithm recommended content.

Table 1. Short video usage behavior and dependency characteristics ($N = 106$)

Indicator	Category	Percentage (%)
Average daily usage duration	2-3 hours	34.91
	> 3 hours	28.3
Average daily opening times	20-30 times	37.74
	> 30 times	29.25
Actively search for specific bloggers	Yes	84.91
The proportion of the recommendation page is 50-80%	Yes	47.17
Try to reduce the use of failures	Occasionally/Often	55.66
Feel anxious/bored when not in use	Occasionally/Often	57.55

More than half of the users occasionally or often failed to reduce usage, and a similar proportion felt anxious or bored when not using short videos. Additionally, 68.87% reported that short video use had a moderate or greater impact on their sleep, work, or study. Specifically, low-intensity users (less than 30

minutes daily) accounted for 7.55%, and those using 30–60 minutes accounted for 11.32%, while 17.92% used 1-2 hours.

4.2.3. Level of parasocial interaction

The overall emotional connection between users and short video bloggers is weak, and a deep emotional bond has not formed. As shown in Table 2, the level of Parasocial Interaction (PSI) between users and bloggers is generally low. Specifically, only 14.15% of users believe that bloggers are like friends, only 18.86% feel a sense of companionship from videos, only 20.75% feel disappointed when bloggers stop posting, and less than 20% of users feel understood and accepted by bloggers.

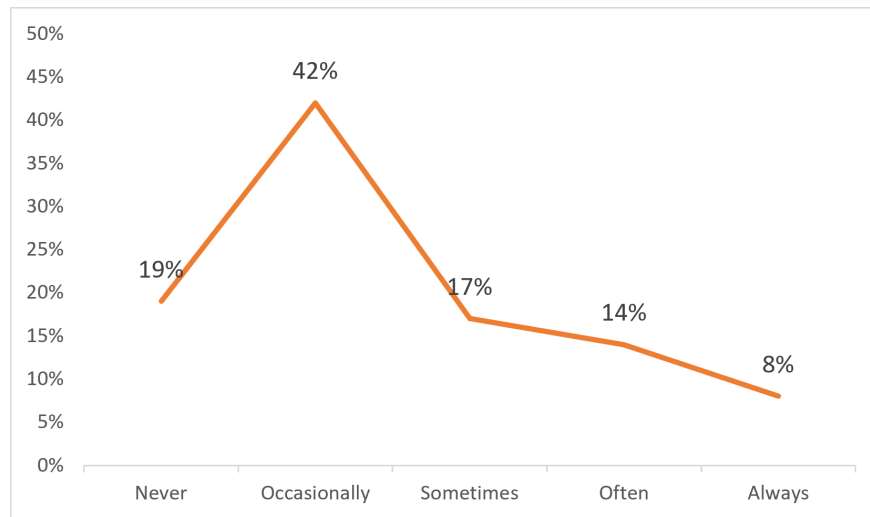


Figure 3. Distribution of users who fail to reduce usage

As shown in Figure 3, the proportion of negative attitudes across all items exceeds 56%, while the proportion of positive attitudes is generally less than 20%. This indicates that the vast majority of users have not established deep emotional connections with bloggers, and the overall level of parasocial interaction is relatively low. The overall level of loneliness among the surveyed group is relatively low. Overall, 66.04% of users rarely feel lonely, and 59.43% of users rarely feel a lack of companionship. However, 40.57% of users sometimes or always feel a lack of companionship.

Table 2. The degree of emotional connection for "directionally focused" users ($N = 106$)

Title	Category	Percentage (%)
Bloggers are like my friends	Negative attitude	63.21
	Neutral attitude	22.64
	Positive attitude	14.15
Care about the blogger's daily life and emotional state	Negative attitude	60.38
	Neutral attitude	21.7
	Positive attitude	17.92
Watching the blogger's videos brings a sense of companionship	Negative attitude	61.32
	Neutral attitude	19.81
	Positive attitude	18.86

Table 2. Continued

If the blogger stops updating, I will feel lost	Negative attitude	56.6
	Neutral attitude	22.64
	Positive attitude	20.75
The blogger understands my thoughts and feelings	Negative attitude	64.15
	Neutral attitude	16.98
	Positive attitude	18.86
Watching short videos makes me feel understood and accepted	Negative attitude	64.15
	Neutral attitude	15.09
	Positive attitude	20.75

4.3. Hypothesis testing

To test the research hypothesis, regression analysis was conducted to examine the relationship between short video usage and loneliness. As shown in Table 3, the standardized regression coefficient for short video usage intensity on loneliness is -0.397 ($p < 0.001$), indicating a statistically significant negative correlation. Based on this result, H1 ("Short video usage intensity has a significant impact on college students' loneliness") is supported.

From the perspective of social substitution behavior, about 20% of respondents agree that "reallife socializing is troublesome and prefer watching short videos for relaxation," and this view is positively correlated with "reducing faceto face gatherings due to watching short videos." Highfrequency use of short videos is significantly correlated with "becoming less adept at faceto face chatting." These correlations indicate that short video usage inhibits reallife social behavior, weakens social skills, and reduces social networks.

The consequences of these reallife social inhibitions point directly to an increase in loneliness: the correlation coefficient between a decrease in reallife friends and loneliness is 0.47, and with lack of companionship is 0.41. The correlation between reducing face-to-face gatherings and loneliness is 0.19. The correlation between being poor at face-to-face chatting and loneliness is 0.39. Therefore, H2 is supported.

Table 3 presents the correlation coefficients for each main variable. The data showed a positive correlation between PSI-related feelings (e.g., feeling understood) and reduced faceto face gatherings, while no significant correlation was found between PSI and perceived relationship harmony. In this sample, PSI did not reach sufficient intensity to constitute an effective mediator nor exhibit a buffering effect on loneliness. Therefore, H3 is not supported.

Table 3. Correlation coefficients of main variables ($N = 106$)

Predictor variable	Coefficient β	p
Intensity of short video usage	-0.397	< 0.001
Real-life social inhibition	0.626	< 0.001
Parasocial interaction	0.367	< 0.001

5. Discussion

5.1. Summary

According to media dependency theory, users' heavy reliance on short videos occupies time and energy that should otherwise be devoted to real-life social interactions. In this study, users exhibited withdrawal symptoms when not using short videos, indicating a certain degree of dependency. This dependency gradually detaches individuals from real-life social scenarios, and the fragmented entertainment provided by short videos cannot replace genuine interpersonal interactions, thereby indirectly exacerbating loneliness.

Specifically, high-intensity short video usage was significantly positively correlated with indicators such as reducing face-to-face gatherings, finding real-life social interactions troublesome, and not being good at face-to-face chatting. These inhibitory behaviors were highly correlated with feelings of loneliness and lack of companionship. This indicates that short videos do not directly cause loneliness, but rather do so indirectly by weakening users' social willingness, ability, and networks, eroding the ecology of real-life social interactions, and subsequently increasing loneliness. This finding echoes the viewpoint that "emotional social loneliness mediates between short video usage and internet addiction tendency," further clarifying the role of social inhibition as a mediating variable [8].

However, the level of Parasocial Interaction (PSI) in this study was generally low. The vast majority of users did not regard bloggers as "friends" and did not feel truly understood by watching short videos. Therefore, this weak virtual connection cannot produce a compensatory effect. The impact of short video usage intensity on college students' loneliness is mainly achieved through the mediating path of "real-life social inhibition". In contrast, the level of PSI is too low to form an effective compensatory mechanism; in some groups, it may even reinforce avoidance of real-life social interaction.

In addition, residential status is highly correlated with the use of short videos, real-life social behaviors, and loneliness, which this study focuses on. Generally speaking, individuals living alone tend to fill the emotional void in their daily lives through online media such as short videos, and their intensity of short video usage and tendency towards social avoidance may also be relatively higher. This sample characteristic provides important support for the analysis of the relationship between short video usage and loneliness in this paper.

5.2. Practical implications

Based on the research findings, this article suggests that short video users should actively balance their online and offline lives, pay attention to their own usage habits, and enhance their self-control ability. For instance, they can use the app's built-in healthy usage reminder, set daily usage duration and time restrictions, avoid excessive use, diversify their entertainment, and alleviate anxiety and boredom when not using the app. Existing research has confirmed a significant positive correlation between stress perception and short video addiction. Therefore, to reduce the intensity of short video use and encourage users to engage in real-life social interactions, individuals can also try mindfulness group counseling to reduce stress perception [9]. Platforms should optimize content quality and diversity by diversifying recommendation algorithms beyond user preferences and setting duration reminders. At the societal level, mental health education and offline social activities should be strengthened to encourage meaningful real-life relationships [9].

5.3. Research limitations

Due to the small sample size in this study, which primarily consists of college students, the conclusions regarding the mediating effect of real-life social inhibition on the relationship between the intensity of short

video use and loneliness lack generalizability. Furthermore, the study did not further explore the psychological mechanisms underlying this inhibitory effect. In the future, it is possible to extend the exploration to include mechanisms related to content types, interaction methods, user personality traits, and other variables in the relationship between usage intensity and loneliness. For example, some studies have pointed out that social support and self-esteem play a mediating role between social inhibition and college student depression. This suggests that the real-life social inhibition triggered by short video addiction may indirectly affect loneliness by influencing variables such as individual self-efficacy, emotional regulation ability, or sense of belonging [10]. Longitudinal studies can be added to more accurately track and investigate changes in short video usage habits and their long-term impacts on loneliness, social status, etc., providing a basis for formulating more effective intervention strategies.

6. Conclusion

Based on questionnaire data from 106 college students, this study explores how the intensity of short-video use affects loneliness, focusing on competitive mediation processes linking real-life social inhibition and parasocial interaction. The results show that the intensity of short video use has a significant negative impact on loneliness ($\beta = -0.397$, $p < 0.001$). That is, the higher the usage intensity, the lower the level of loneliness. Real-life social inhibition plays a positive mediating role between the two (correlation coefficient 0.626). Short videos indirectly exacerbate loneliness by crowding out social time, weakening social skills, and shrinking social networks. Parasocial interaction, on the other hand, does not show a significant negative buffering effect. The overall level of parasocial interaction between users and bloggers is low, and it cannot effectively replace real-life emotional connections.

The sample is limited to the college student population, and its generalizability needs further exploration. Moreover, the reliability of the self-developed scale needs improvement, and additional variables should be included to examine the psychological mechanisms underlying social inhibition. In the future, it is necessary to further enhance longitudinal tracking, expand the sample range, optimize measurement tools, and introduce richer relevant variables to deepen the mechanism analysis.

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