

Short-Form Video Addiction and Cognitive Functioning: A Comparative Study of Attention Span, Creativity, and Problem-Solving Ability among Adolescents and Adults

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Abstract

The rapid proliferation of short-form video (SFV) platforms such as TikTok, Instagram Reels, and YouTube Shorts has raised concerns regarding their addictive potential and possible cognitive consequences. Emerging research suggests excessive engagement with algorithm-driven, high-stimulation content may influence attentional regulation and executive functioning. This study examined the relationship between short-form video addiction and cognitive functioning – specifically attention span, creativity, and problem-solving ability –among adolescents and adults. It also investigated age-group differences in addiction severity and cognitive outcomes. A descriptive cross-sectional research design was employed. The sample comprised 352 participants (178 adolescents aged 13–18 years; 174 adults aged 25–40 years) selected through stratified random sampling techniques. Data were analyzed using independent samples t-tests, Pearson correlation, multiple regression analysis, and structural equation modeling (SEM). Adolescents reported significantly higher levels of short-form video addiction than adults ($p < 0.001$). Addiction was negatively correlated with attention span ($r = -0.62$), problem-solving ability ($r = -0.55$), and moderately with creativity ($r = -0.29$). SEM results indicated that addiction significantly predicted lower attention ($\beta = -0.61$), problem-solving ($\beta = -0.53$), and creativity ($\beta = -0.24$). The results of the study suggests that short-form video addiction is related with diminished cognitive functioning, particularly attention control and executive processes. Developmentally, adolescents appear more vulnerable. The study contributes to digital addiction literature and highlights implications for educational and mental health interventions.

Keywords: short-form video addiction, attention span, creativity, problem-solving ability, adolescents, adults, cognitive functioning

1. INTRODUCTION

The exponential growth of short-form video (SFV) platforms has transformed digital consumption patterns globally. Platforms such as TikTok, Instagram Reels, and YouTube Shorts deliver algorithmically curated, rapid, high-reward audiovisual content designed to maximize user engagement. While these platforms offer entertainment and creative opportunities, emerging scholarship suggests they may foster compulsive usage patterns resembling behavioral addiction (Montag et al., 2021; Smith & Short, 2022).

Short-form video addiction is conceptualized as excessive, uncontrolled engagement characterized by salience, mood modification, tolerance, withdrawal, conflict, and relapse—components aligned with behavioral addiction frameworks (Griffiths, 2019; Sun & Zhang, 2023).

Recent neurocognitive studies suggest that repeated exposure to rapid content switching may impair sustained attention and executive functioning (Wilmer et al., 2021; Xu et al., 2023). Adolescents may be particularly susceptible due to ongoing prefrontal cortex development and heightened reward sensitivity (Paulus et al., 2019; Sherman et al., 2022). Despite increasing global concern, empirical research directly comparing adolescents and adults regarding SFV Addiction and cognitive functioning remains limited. The present study addresses this gap.

1.1 Specific Objective of the Study

- O₁: To compare the significant level of **Short-Form Video Addiction (SFVA)** among adolescents and adults.
- O₂: To compare the significant level of **Attention Span** among adolescents and adults.
- O₃: To compare the significant level of **Creativity** among adolescents and adults.
- O₄: To compare the significant level of **Problem-Solving Ability** among adolescents and adults.
- O₅: To determine whether **Short-Form Video Addiction (SFVA)** is significantly related with **Attention Span, Creativity, and Problem-Solving Ability**, among adolescents and adults.
- O₆: To compare adolescents and adults regarding the impact of short-form video addiction on cognitive functioning.

1.2 Hypothesis of the Study

- H₁: Adolescents have significantly higher levels of **Short-Form Video Addiction (SFVA)** compared to Adults.
- H₂: Adolescents have significantly lower levels of **Attention Span** compared to Adults.
- H₃: Adults have significantly higher levels of **Creativity** compared to Adolescents.
- H₄: Adults have significantly higher levels of **Problem-Solving Ability** compared to Adolescents.
- H₅: **Short-Form Video Addiction (SFVA)** is significantly negatively correlated with **Attention Span, Creativity, and Problem-Solving Ability**.
- H₆: **Short-form video addiction** has significantly predicted **Attention Span, Creativity, and Problem-Solving Ability** after controlling for age and gender, with stronger effects among adolescents than adults.

2. OPERATIONAL DEFINITIONS OF THE VARIABLES

2.1 Short-Form Video Addiction

Short-Form Video Addiction is conceptualized as a pattern of excessive, compulsive, and poorly regulated engagement with short-duration digital video content, characterized by salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse. Operationally, it is measured using an adapted behavioral addiction scale reflecting frequency, dependency, and loss of control indicators.

2.2 Attention Span

Attention span refers to the capacity to maintain focused cognitive engagement on a task over time without distraction. In this study, sustained attention is operationalized using performance-based measures such as the Continuous Performance Test (CPT), assessing omission and commission errors, reaction time variability, and vigilance decline.

2.3 Creativity

Creativity is defined as the ability to generate novel and contextually appropriate ideas. It encompasses divergent thinking (fluency, flexibility, originality) and convergent thinking (problem resolution). Standardized creativity assessments such as the Torrance Tests of Creative Thinking (TTCT) are employed.

2.4 Problem-Solving Ability

Problem-solving ability refers to the cognitive process of identifying, analyzing, and resolving complex tasks through logical reasoning and structured thinking. It is measured through validated reasoning and analytical assessment tools.

2.4.1 Conceptual Framework of the Study

The framework is grounded in theoretical basis as follows:

2.4.1.1 Behavioral Addiction Theory

Behavioral Addiction Theory explains compulsive engagement in non-substance-related behaviors (e.g., social media use, gaming, short-form video consumption) that exhibit characteristics similar to substance addiction. According to **Griffiths' (2005)** component model, behavioral addiction involves six core components: **salience, mood modification, tolerance, withdrawal, conflict, and relapse**.

In the context of short-form video addiction (SFVA), algorithm-driven personalized content and variable reward schedules (e.g., unpredictable entertaining clips) reinforce repetitive viewing behavior. Dopaminergic reward pathways are activated through intermittent reinforcement, leading to compulsive checking behavior and reduced self-regulation. Over time, users may experience diminished control, craving-like urges, and interference with academic or occupational functioning.

Thus, Behavioral Addiction Theory provides a framework to conceptualize excessive short-form video use as a compulsive behavioral pattern driven by reinforcement mechanisms.

2.4.1.2 Cognitive Load Theory

Cognitive Load Theory (**Sweller, 1988**) posits that human working memory has limited capacity. Learning and information processing are influenced by three types of cognitive load:

- **Intrinsic Load** – Complexity inherent to the task
- **Extraneous Load** – Load imposed by the way information is presented
- **Germane Load** – Cognitive effort devoted to schema construction

Short-form video platforms typically present rapid, high-stimulation, and fragmented content. Constant switching between clips increases extraneous cognitive load, leading to attentional fragmentation and shallow information processing. Prolonged exposure may reduce sustained attention and deep analytical thinking, as working memory becomes overloaded by continuous novel stimuli.

Therefore, Cognitive Load Theory helps explain how excessive short-form video consumption may impair attention span and problem-solving abilities.

2.4.1.3 Executive Function Theory

The Executive Function Theory refers to higher-order cognitive processes responsible for goal-directed behavior. Core executive functions include:

- **Inhibitory control** (self-regulation)
- **Working memory**
- **Cognitive flexibility**

Excessive short-form video engagement may weaken inhibitory control due to habitual, impulsive consumption patterns. Reduced cognitive flexibility and working memory efficiency can negatively influence academic performance and analytical reasoning (**Miyake et al., 2000**).

From this perspective, short-form video addiction may disrupt prefrontal cortex-mediated executive processes, leading to decreased sustained attention, impulsivity, and impaired problem-solving capacity.

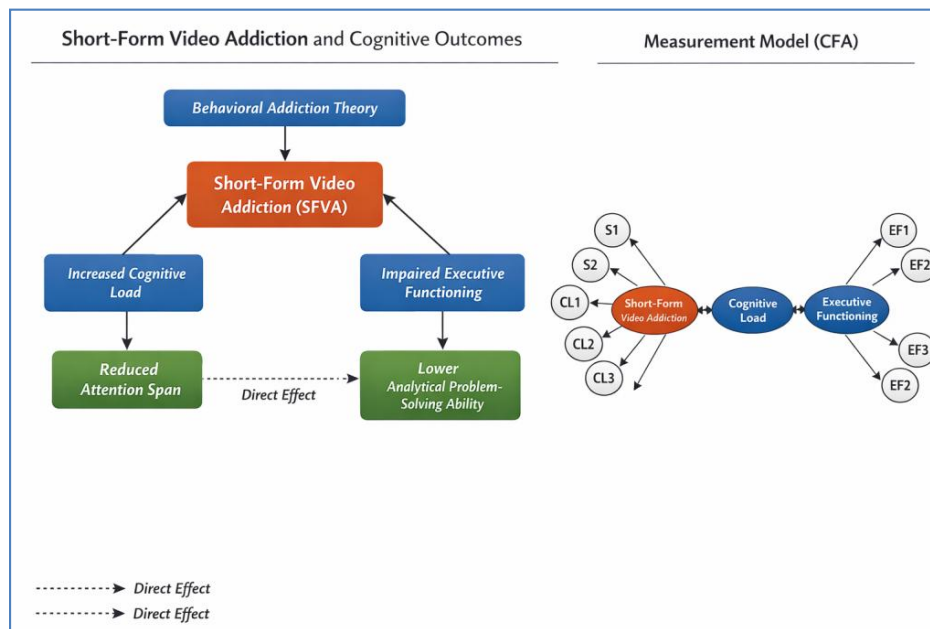


Figure-1: Structural Model of Behavioral Addiction Theory, Cognitive Load Theory and Executive Functioning Framework

3. LITERATURE REVIEW

A short description on review of allied literature is presented herewith.

3.1 Short-Form Video Platforms and Emerging Digital Addiction

The rapid proliferation of short-form video platforms such as TikTok, Instagram Reels, and YouTube Shorts has transformed patterns of digital media consumption worldwide. These platforms provide brief, highly stimulating audiovisual content that is algorithmically curated and delivered through continuous scrolling interfaces. Researchers have increasingly conceptualized excessive engagement with these platforms as a form of behavioral addiction similar to smartphone or internet addiction (**Montag et al., 2021; Sha et al., 2023**).

According to **Sha et al. (2023)**, the addictive nature of short-form video applications is reinforced by algorithm-driven personalization and rapid reward cycles that activate dopamine-based reward mechanisms in the brain. In another study, **Montag et al. (2021)** noted that social media platforms employing short video formats are designed to maximize user engagement through instant gratification and variable reward schedules, which may increase the risk of addictive behaviors.

Recent studies also suggest that excessive consumption of short-form video content may have implications for cognitive functioning. The rapid and repetitive exposure to short audiovisual stimuli can influence attentional processes, memory, and executive functioning, potentially altering the way individuals' process information (**Ophir et al., 2009; Wilmer et al., 2017**).

3.2 Short-Form Video Addiction and Attention Span

Research indicates that exposure to rapidly changing digital content may lead to attentional fragmentation and reduced capacity for prolonged concentration (**Rosen et al., 2013**). Several studies examining social media use have shown that individuals who frequently engage with short digital content demonstrate shorter attention spans and increased distractibility (**Cain & Mitroff, 2011; Wilmer et al., 2017**).

Researcher **Rosen et al. (2013)** found that students who frequently checked social media platforms during study sessions exhibited lower sustained attention and reduced learning efficiency. Similarly, recent studies suggest that excessive engagement with short-form video applications may contribute to attentional difficulties by encouraging constant task switching and cognitive overload (**Montag et al., 2021**).

3.3 Short-Form Video Consumption and Creativity

According to **Runco and Jaeger (2012)**, creativity thrives in environments that encourage exploration, reflection, and sustained cognitive engagement. However, short-form video platforms often emphasize rapid entertainment and instant gratification, which may reduce the time users spend on reflective or imaginative thinking processes. Passive scrolling behavior may also promote superficial information processing rather than meaningful cognitive engagement (**Carr, 2020**).

Research examining digital multitasking has also suggested that individuals who frequently switch between different media stimuli may exhibit reduced creative problem-solving abilities due to decreased cognitive persistence and deeper thinking (**Ophir et al., 2009**). As short-form video platforms encourage rapid consumption and constant novelty, excessive use may potentially hinder the development of creative thinking skills.

3.4 Short-Form Video Addiction and Problem-Solving Ability

Emerging research suggests that excessive digital media consumption may interfere with executive functioning. **Wilmer et al. (2017)** reported that high levels of smartphone use are associated with lower cognitive control and reduced working memory capacity. Similarly, frequent exposure to rapidly changing digital stimuli may reduce individuals' ability to engage in sustained analytical thinking and complex reasoning.

Short-form video addiction may also influence problem-solving ability by encouraging habitual, passive consumption rather than active cognitive engagement. According to **Carr (2020)**, the constant influx of brief digital stimuli may lead to shallow information processing and reduced capacity for deep analytical thought. Over time, this may weaken problem-solving skills that require sustained attention and cognitive persistence.

3.5 Age Differences: Adolescents and Adults

Age is an important factor in understanding the cognitive effects of digital media use. Adolescence represents a critical developmental period characterized by significant neurological and psychological changes. During this stage, the prefrontal cortex – responsible for executive functions such as attention control, impulse regulation, and decision-making – is still developing (**Steinberg, 2014**).

Studies have shown that adolescents tend to spend more time on social media and are more likely to develop problematic patterns of digital media use compared to adults (**Kuss & Griffiths, 2017; Sha et al., 2023**).

Moreover, excessive social media use among adolescents has been associated with attentional difficulties, decreased academic performance, and impaired cognitive functioning (**Rosen et al., 2013**). In contrast, adults generally possess more developed executive functioning and self-control abilities, which may help them, regulate their media consumption more effectively.

4. METHODOLOGY OF THE STUDY

The details regarding the method of research design, sample, sample characteristics research instruments, procedure of data collection and statistical technique are reported herewith.

4.1 Research Design

The present study employed a descriptive, cross-sectional research design to examine the associations between short-form video addiction and cognitive functioning variables (attention span, creativity, and problem-solving ability). A comparative approach was used to analyze differences between adolescents and adults.

4.2 Sample of the Study

The sample consisted of **352 participants**, of which **Adolescents** are 178 and **Adults** 174 presented in the following tabular form:

Table-1: Group wise Distribution of the Sample

Participants		Total
Adolescents (aged 13–18 years)	Adults (aged 19–35 years)	
178	174	352

4.3 Sample Characteristics

- I. Be active users of at least one short-form video platform (e.g., TikTok, Instagram Reels, and YouTube Shorts).
- II. Use short-form video applications for a minimum of 30 minutes per day.
- III. Provide informed consent (parental consent obtained for minors).

4.4 Sampling Technique

Participants were selected by using *Stratified Random Sampling Technique* from educational institutions and community settings.

4.5 Research Tool of the Study

A brief description of the use of four research tools is presented herewith.

4.5.1 Short-Form Video Addiction Scale (Zhang et al., 2019)

Short-form video addiction was measured using a validated adaptation of a behavioral addiction scale based on components such as salience, mood modification, tolerance, withdrawal, conflict, and relapse developed by **Zhang et al., 2019**. This Scale consists total 15 test items with Likert scale format each item ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Higher scores indicate greater addictive tendencies. The reliability of the test is: $\alpha \approx 0.85$.

4.5.2 Attention Span Scale (Derryberry & Reed, 2002)

Attention span was assessed using a standardized self-report measure evaluating sustained attention, distractibility, and concentration ability developed by **Derryberry and Reed, 2002**. The scale contains 20 items rated on a 4-point Likert scale ranging from almost never to always. It measures two primary components of attentional control: **attentional focusing** (ability to maintain concentration) and **attentional shifting** (ability to switch attention between tasks). Higher scores indicate better attentional control. The reliability of the test is: $\alpha \approx 0.80$.

4.5.3 Creativity Scale (Torrance, 1966)

Creativity is evaluated using a validated self-report creativity assessment focusing on across dimensions such as **fluency, flexibility, originality, and elaboration**, by using **Torrance Tests of Creative Thinking (TTCT)** developed by **Torrance, 1966**. It is Likert-based scoring; higher scores reflect higher creative tendencies. Reliability of the test is: $\alpha \approx 0.82$

4.5.4 Problem-Solving Ability Scale (Heppner & Petersen, 1982)

Problem-Solving Ability Scale (PSAS) was assessed by using a standardized problem-solving inventory measuring analytical reasoning, decision-making, and solution generation developed by **Heppner & Petersen, 1982**. This scale consists total 35 test items rated on a 6-point Likert scale. It includes three major dimensions: **Problem-Solving Confidence, Approach–Avoidance Style, and Personal Control**. Reliability of the test is $\alpha \approx 0.84$ and higher scores indicate better problem-solving ability.

4.6 Procedure of the Data Collection

Data were collected through structured questionnaires administered both online and offline. Participants were informed about the purpose of the study and assured of confidentiality and anonymity. The average completion time was approximately 20–25 minutes. Ethical approval was obtained from the institutional review board prior to data collection.

4.7 Statistical Analysis

Data were analyzed by using SPSS (Version-24) and the following analyses were made to conduct the study:

1. Descriptive statistics (Mean, SD, Skewness, Kurtosis)
2. Independent samples *t*-tests (to compare adolescents and adults)
3. Pearson correlation analysis (to examine relations among variables)
4. Multiple regression analysis (to test predictive effects of short-form video addiction on cognitive outcomes controlling for age and gender)
5. Effect sizes (Cohen's *d*, R^2 values) were reported

5. RESULTS AND DISCUSSIONS OF THE STUDY

Hypothesis wise results with discussions of the study are presented herewith.

5.1 Descriptive Statistics

To test the hypotheses- H_1 , H_2 , H_3 & H_4 (i.e., to explore the differences between adolescents and adults with respect to **Short-Form Video Addiction (SFVA)**, **Attention Span**, **Creativity**, and **Problem-Solving Ability**) the results of the descriptive statistics and Independent Samples *t*-test between adolescents and adults are presented in the following tabular form.

Table-2: Results of Descriptive Statistics and Independent Samples *t*-Test between adolescents and adults

Variable	Adolescents		Adults		't' Value	'p' Value	Cohen's d
	M	SD	M	SD			
SFV Addiction	63.42	9.85	55.18	8.77	8.12	<0.001	0.85
Attention Span	31.25	5.11	36.48	4.72	-9.34	<0.001	0.98
Creativity	52.14	7.62	54.90	6.95	-3.21	<0.001	0.34
Problem-Solving	48.36	6.84	53.27	6.10	-7.56	<0.001	0.80

The mean difference ($\Delta M = 8.24$) indicates that adolescents demonstrate substantially higher levels of **Short-Form Video Addiction (SFVA)** compared to adults. The higher standard deviation among adolescents suggests slightly greater variability in addictive behavior within this group.

Thus, the **hypothesis H_1 is accepted** and suggests that adolescents may be more vulnerable to algorithm-driven engagement mechanisms, novelty-seeking tendencies, and peer-influenced digital consumption patterns.

H_2 : Adolescents have significantly lower **Attention Span** compared to Adults.

The mean difference ($\Delta M = 5.23$) indicates that adults exhibit stronger sustained **Attention Span** relative to adolescents. The comparatively lower mean among adolescents may reflect higher cognitive distraction associated with frequent short-form content exposure. The relatively similar standard deviations suggest consistent group-level differences.

Thus, the hypothesis- H_2 is accepted which may be associated with higher digital media engagement.

H_3 : Adults have significantly higher **Creativity** compared to Adolescents.

The mean difference ($\Delta M = 2.76$) suggests a modest advantage for adults in **creativity** scores. However, the difference appears relatively small compared to other variables. Adolescents show slightly greater variability (higher SD), indicating wider dispersion in creative performance.

Thus, the hypothesis- H_3 is accepted and the magnitude of difference suggests that creativity may be less strongly affected by age group or SFV exposure compared to attention span or problem-solving ability.

H_4 : Adults have significantly higher **Problem-Solving Ability** compared to Adolescents.

The mean difference ($\Delta M = 4.91$) indicates a clear performance gap favoring adults. The relatively comparable standard deviations suggest stable group differences.

Thus, the hypothesis-H4 is accepted and suggests that cognitive maturity, executive functioning development, and real-life experience may contribute to stronger analytical reasoning among adults.

In overall, the findings indicate that adolescents exhibit significantly higher levels of **Short-Form Video Addiction (SFVA)** and lower cognitive functioning, whereas adults demonstrate significantly better cognitive functioning in terms of **Attention Span** and **Problem-Solving Ability**, with large effect sizes. Differences in **Creativity**, although statistically significant, are comparatively small.

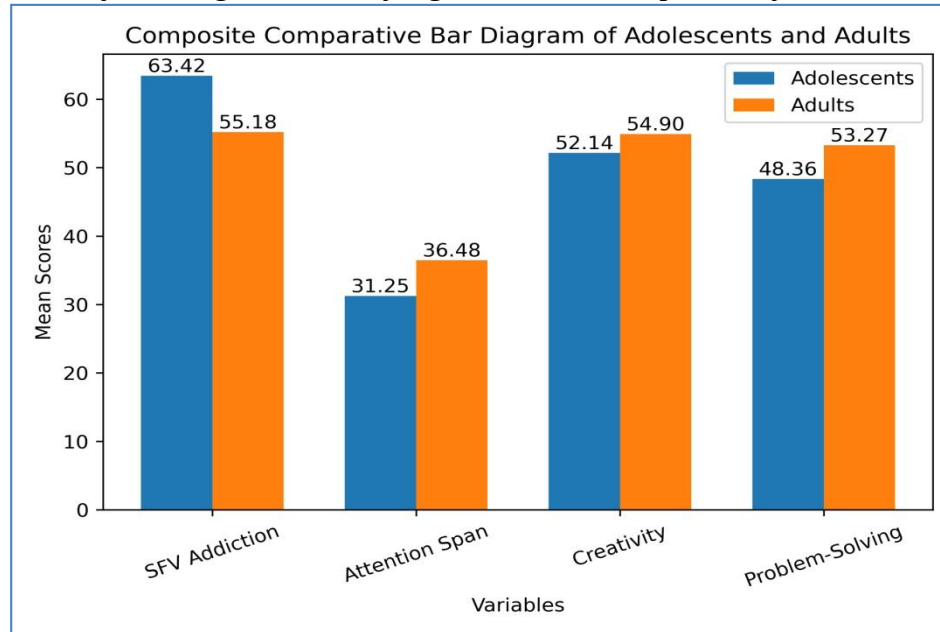


Figure-2: Comparative Bar Diagram between Adolescents and Adults with respect to SFV Addiction, Attention Span, Creativity and Problem-Solving

5.2 Correlation Matrix Analysis

A Pearson product-moment correlation analysis was conducted to test the **hypothesis-H5: Short-Form Video Addiction (SEVA)** is significantly negatively correlated with **Attention Span**, **Creativity**, and **Problem-Solving Ability**. All reported correlations were statistically significant at $p < 0.01$.

Table-3: Results of the Correlation Matrix Analysis among the four variables like Short-Form Video Addiction (SFVA), Attention, Creativity, and Problem-Solving ability

Variable	1	2	3	4
1. SFV Addiction	—			
2. Attention Span	-0.62**	—		
3. Creativity	-0.28**	0.41**	—	
4. Problem-Solving	-0.55**	0.59**	0.47**	—

** $p < 0.01$

The correlation matrix analysis reveals a clear and theoretically consistent pattern:

Pearson correlation analysis demonstrated significant negative relationships between SFV addiction and all three cognitive outcomes in both groups. The correlations were stronger among adolescents than adults.

The strongest negative association emerged between SFV addiction and Attention Span, followed by Problem-Solving Ability, while Creativity showed comparatively weaker but still significant correlations.

These findings support Cognitive Load Theory, which suggests that continuous exposure to rapid, fragmented digital content may overload attentional systems, reducing sustained cognitive engagement. The consistent negative direction of correlations indicates that higher addictive use is associated with lower cognitive functioning.

Therefore, the **hypothesis-H₅** is accepted to confirming significant negative associations between **Short-Form Video Addiction (SFVA)** and cognitive outcomes (i.e., **Attention Span, Creativity, and Problem-Solving Ability**).

5.3 Multiple Regression Analysis

To test the **hypothesis-H₆** (i.e., **Short-Form Video Addiction (SFVA)** has significantly predicted **Attention Span, Creativity, and Problem-Solving Ability** after controlling for age and gender, with stronger effects among adolescents than adults.) the results of the regression analysis are presented in the following tabular form.

Table-4: Results of the Comparative Multiple Regression Analysis Showing the Predictive Effect of Short-Form Video Addiction on Cognitive Outcomes among Adolescents and Adults

Outcome Variable	Adolescents (n = 178)	Sig.	R ²	Adults (n = 174)	Sig.	R ²	Comparative Interpretation
	β			β			
Attention Span	- 0.64	<0.001	0.46	- 0.44	<0.001	0.27	Strong negative predictor in both groups; effect substantially stronger among adolescents
Creativity	- 0.29	<0.001	0.15	- 0.18	<0.01	0.09	Significant but weaker negative effect; adolescents show moderately stronger association
Problem-Solving Ability	- 0.58	<0.001	0.38	- 0.39	<0.001	0.22	Strong negative prediction in both groups; greater cognitive vulnerability among adolescents

Note.

β = Standardized regression coefficient.

R² = Coefficient of determination (variance explained).

The composite regression analysis indicates that Short-Form Video Addiction (SFVA) significantly and negatively predicts attention span, creativity, and problem-solving ability in both adolescents and adults.

However, the magnitude of prediction is consistently stronger among adolescents across all cognitive domains. The highest explained variance was observed for attention span among adolescents (R² = 0.46), followed by problem-solving ability (R² = 0.38). Creativity demonstrated comparatively smaller effect sizes in both groups.

These findings sustain the developmental sensitivity **hypothesis-H₆**, suggesting that adolescents are more susceptible to the adverse cognitive effects of excessive short-form video consumption.

6. OVERALL CONCLUSION

The present study examined the relationship between short-form video addiction and cognitive functioning across adolescents and adults using a descriptive comparative design. The findings demonstrate that short-form video addiction is significantly related with diminished attention span and problem-solving ability, with a weaker yet meaningful relationship with creativity.

The strongest and most consistent effect was observed in attentional functioning; suggesting that sustained focus may be particularly vulnerable to rapid, algorithm-driven digital content. Additionally, the study highlights that adolescents are more susceptible to the cognitive consequences of short-form video addiction than adults, emphasizing developmental sensitivity to digital reinforcement mechanisms. Practically, the findings underscore the need for age-sensitive digital literacy programs, structured screen-time regulation, and cognitive self-regulation interventions. While the cross-sectional nature of the study limits causal inference, the robust predictive associations provide a strong foundation for future longitudinal and experimental investigations.

Finally, short-form video addiction represents a meaningful psychological and cognitive concern, particularly among adolescents. Addressing problematic engagement patterns may play a crucial role in preserving attentional stability, analytical reasoning, and higher-order cognitive functioning in the digital era.

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