



Brain Rot in the Digital Age: Investigating the Effects of Excessive Screen Time on Cognitive Function in Young Adults

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Abstract: In the contemporary digital era, social media has become an integral part of daily life, particularly among young adults. While these platforms offer avenues for connection and information sharing, concerns have emerged regarding their potential impact on cognitive functions. This study examines the relationship between social media usage patterns and cognitive functioning, focusing on attention control and the frequency of cognitive failures among individuals aged 18 to 25. Employing a quantitative research design, data were collected from 130 participants using three validated instruments: the Social Media Usage Questionnaire (SMUQ), the Attention Control Scale (ACS), and the Cognitive Failures Questionnaire (CFQ). Statistical analyses, including Pearson correlation and multiple regression, revealed a significant association between higher levels of social media engagement and reduced attention control, alongside an increase in everyday cognitive errors such as forgetfulness and distractibility. These findings suggest that excessive or habitual use of social media may contribute to cognitive overload and diminished attentional regulation. The study underscores the importance of promoting balanced digital consumption and developing interventions aimed at mitigating the cognitive challenges associated with intensive social media use. By understanding these dynamics, stakeholders can better support the cognitive well-being of young adults in an increasingly connected world.

Keywords: *Brain Rot, Digital Age, Screen Time, Cognitive Function, Young Adults*

1. Introduction

In the contemporary digital landscape, social media platforms have seamlessly woven themselves into the fabric of daily life, particularly among young adults. These platforms offer

unprecedented avenues for connection, self-expression, and information dissemination. However, the omnipresence and often excessive engagement with social media have sparked concerns regarding their potential impact on cognitive functions, notably attention control and executive functioning.

The term "brain rot," though colloquial and not clinically recognized, has emerged to describe the perceived decline in mental acuity and attentiveness attributed to prolonged digital exposure. This phenomenon encapsulates a growing awareness of cognitive fatigue and diminished focus associated with excessive screen time. Features intrinsic to social media—such as infinite scrolling, algorithm-driven content, and incessant notifications—are meticulously designed to maximize user engagement. Yet, they may inadvertently contribute to cognitive overload and reduced attention spans.

Emerging research indicates a correlation between high social media usage and various cognitive challenges, including memory lapses, decreased attention control, and increased cognitive failures. These effects are particularly concerning for adolescents and young adults, whose brains are still developing and may be more susceptible to the influences of digital environments. For instance, studies have shown that excessive social media use is associated with attention deficits and memory loss among youth, leading to concerns about cognitive decline in this demographic. ([anews.com.tr][1])

Despite these concerns, there is a paucity of empirical studies specifically examining the direct relationship between social media usage patterns and cognitive functions such as attention regulation and executive functioning. This study aims to fill this gap by investigating the association between social media use and cognitive performance among individuals aged 18 to 25. Utilizing validated psychometric instruments—the Social Media Usage Questionnaire (SMUQ), the Attention Control Scale (ACS), and the Cognitive Failures Questionnaire (CFQ)—this research seeks to determine whether excessive social media engagement correlates with diminished attention control and increased cognitive failures.

By exploring these relationships, the study endeavors to contribute to a deeper understanding of the cognitive implications of social media overuse and to inform strategies that promote healthier digital habits among young adults. The pervasive integration of social media into daily life has introduced continuous digital stimulation, significantly influencing the brain's

cognitive systems. While these platforms enhance connectivity and information access, excessive and unregulated use can adversely affect various aspects of cognitive function.

Social media platforms, particularly those featuring short-form content like TikTok and Instagram Reels, promote brief bursts of attention, which can diminish the brain's capacity for deep, sustained concentration. This shift in attention patterns makes it challenging for individuals, especially adolescents, to engage in prolonged tasks requiring mental endurance, such as studying or reading. Research has shown that digital multitasking, often involving social media use, negatively affects cognitive tasks and academic outcomes. ([ERIC][2])

The constant influx of notifications and the habit of switching between multiple apps contribute to cognitive overload, overwhelming the working memory. This overload impairs the ability to retain important information, leading to forgetfulness and increased cognitive errors in daily activities.

Moreover, multitasking behaviors encouraged by social media—such as browsing while conversing or studying—can disrupt executive functions. Over time, this can result in impaired decision-making, poor planning, and reduced emotional regulation.

Regular exposure to rapidly changing, superficial content may also slow down processing speed, as the brain becomes accustomed to simplified information, hindering the ability to analyze complex problems or construct well-reasoned arguments.

Attention, a fundamental cognitive process, is particularly affected. Sustained attention, necessary for tasks like studying or attending lectures, is compromised by the rapid content consumption on social media. Selective attention suffers due to the multitude of competing stimuli on these platforms, making it difficult to focus on a single task. The promotion of divided attention or multitasking further reduces the quality of attention applied to any one activity, and frequent task-switching weakens alternating attention control, leading to mental fatigue and decreased efficiency.

Adolescents are especially vulnerable to these effects due to the ongoing development of their prefrontal cortex, which governs attention and executive control. Excessive social media use during this critical developmental period can lead to lasting deficits in attention, increasing the risk of poor academic performance and attention disorders.

Cognitive failures, such as forgetting appointments or misplacing items, are everyday errors that can be exacerbated by the cognitive strain induced by social media. The overload of information, continuous task-switching, reduced deep cognitive engagement, and disrupted sleep patterns associated with excessive social media use contribute to an increased frequency of these failures.

The habitual and often compulsive nature of social media usage is driven by platform designs that maximize user engagement through features like infinite scrolling and personalized content algorithms. These designs exploit psychological triggers, reinforcing continuous interaction and deepening the compulsion to stay connected, often at the expense of attention, productivity, and emotional well-being.

Adolescents' need for social validation, susceptibility to peer pressure, and developing self-control make them particularly influenced by these usage patterns. The emotional dependency on online feedback can distort self-image and increase sensitivity to rejection or comparison, leading to heightened levels of anxiety, social pressure, and low self-esteem.

The rise of social media has introduced constant digital stimulation that significantly influences the brain's cognitive systems. While these platforms offer benefits in terms of connectivity and information access, excessive and unregulated use can negatively impact various components of cognitive function, particularly in adolescents. Understanding these impacts is crucial for developing strategies that encourage healthier digital habits and protect cognitive health in the digital age.

2. Research Methodology

2.1 Aim

The primary aim of this study is to investigate the impact of excessive social media usage on cognitive functioning and attention control in adolescents. Specifically, it seeks to examine whether increased screen time is associated with higher levels of cognitive failures and reduced attention span.

2.2 Variables of the Study

Independent Variable:

Social Media Usage (measured using the Social Media Usage Questionnaire)

Dependent Variables:

Cognitive Functioning (measured using the Cognitive Failure Questionnaire)

Attention Control (measured using the Attention Control Scale)

2.3 Hypotheses

H1: Excessive social media usage is negatively associated with cognitive functioning in young adults.

H2: Increased social media usage is associated with reduced attention control in young adults.

2.4 Research Design

Research Type: Correlation study

This study employs a quantitative, correlational research design to explore the relationships between social media usage, cognitive failures, and attention control. Statistical analyses such as Pearson correlation and linear regression were used to test the hypotheses. Correlational studies are suitable for understanding how two or more variables relate to each other without manipulating the variables themselves.

2.5 Sampling

The sample for this study will consist of 100+ young adults aged between 18 and 30 years. Participants will be recruited from universities and social platforms through advertisements and word-of-mouth. The age range is chosen to align with the developmental period characterized by heightened cognitive and emotional sensitivity to social media exposure. The study will ensure a diverse sample in terms of gender, cultural background.

Sampling Technique

A convenience sampling method will be employed to facilitate easy access to participants within the target age group. Although this approach may introduce some potential bias, it is frequently used in psychological research due to its practicality and efficiency. The study will include adolescents who are readily accessible and willing to participate. Ethical considerations, such as obtaining informed consent and ensuring participant anonymity, will be strictly adhered to throughout the research process.

2.6 Data Collection Methods

Survey Instrument

2.6.1 Social Media Usage Questionnaire (SMU)

The Social Media Use Questionnaire (SMUQ) developed by Xanidis and Brignell (2016) was used to assess the frequency and intensity of participants' social media engagement. The scale includes items that measure behaviors such as compulsive checking, difficulty disengaging from platforms, and the impact of social media on daily routines and responsibilities.

2.6.2 Cognitive Failures Questionnaire (CFQ)

Developed by Broadbent, Cooper, and FitzGerald (1982), the CFQ measures everyday cognitive lapses such as forgetfulness, attention slips, and action errors. It's widely used to evaluate general cognitive functioning.

2.6.3 Attention Control Scale (ACS)

Created by Derryberry and Reed (2002), the ACS evaluates a person's ability to focus, shift, and control attention. It is often used in studies related to attention regulation and emotional control.

2.7 Procedure

Participants will be asked to complete the questionnaire online via a secure survey platform. The study will be explained to participants in detail, and their consent will be obtained before participation. The estimated time for completing the survey will be 20 to 30 minutes. Responses will be anonymous, and participants will have the option to withdraw from the study at any time without penalty.

2.8 Data Analysis

Statistical Methods

To test the hypotheses, the following statistical methods will be employed:

- 1. Descriptive Statistics** – To summarize the demographic information and basic data distribution.
- 2. Pearson Correlation Analysis** – To examine the strength and direction of the relationship between attachment style and sociosexual orientation.
- 3. Linear Regression Analysis** – To examine the predictive role of social media usage on cognitive functioning and attention control in adolescents

Statistical Analysis

All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics were computed for all variables to understand the distribution and central tendencies within the dataset. These included means, standard deviations,

minimum and maximum scores, as well as skewness and kurtosis values to assess the normality of the data. To explore the relationships among social media usage, cognitive functioning, and attention control, Pearson product-moment correlation was employed. This analysis was used to examine the strength and direction of the association between the independent variable (social media usage) and the two dependent variables (cognitive failures and attention control). Following the correlation analysis, two simple linear regression analyses were performed to investigate the predictive value of social media usage on cognitive functioning and attention control. In the first model, cognitive failure scores were regressed on social media usage to determine whether higher usage significantly predicted greater cognitive lapses. In the second model, attention control was regressed on social media usage to examine if increased social media use corresponded with reduced attentional capacity.

3. Data Analysis

The present study aimed to examine the relationship between social media usage and cognitive outcomes—specifically cognitive failures and attention control—in adolescents. For data collection, a structured online questionnaire was created using Google Forms, which allowed for efficient distribution and easy accessibility for participants. The questionnaire included three standardized scales: Social Media Usage Questionnaire (SMU), Cognitive Failure Questionnaire (CFQ) and The Attention Control Scale (ATTC). The form was circulated through various online platforms, including social media and personal networks, to reach a diverse sample of young adults. Upon completion of data collection, the responses were transferred to Microsoft Excel for coding, reverse scoring, and preliminary calculations such as subscale totals and overall scores for both ASQ and SOI-R. The cleaned and scored dataset was then imported into IBM SPSS (Statistical Package for the Social Sciences) version 26 for statistical analysis, including descriptive statistics, reliability testing, and correlation analysis, to address the study's objectives and test the proposed hypotheses. Descriptive statistics were conducted on the data. Since all skewness values (ranging from -0.019 to 0.140) and kurtosis values (ranging from -0.399 to -0.244) fell within the range of ± 2 for skewness and ± 7 for kurtosis (West, Finch, & Curran, 1995), the assumption of normality was not violated.

Table 1. *Descriptive Statistics*

Variable	Mean	SD	Min	Max	Skew	Kurtosis
CFQ	40.37	7.626	7	77	0.003	-0.333
SMU	17.42	3.348	3	32	0.140	-0.244
ATTC	28.67	1.852	9	47	-0.019	-0.399

Note: CFQ, Cognitive Failure Questionnaire; SMU, Social Media Usage Questionnaire; ATTC, Attention Control Scale.

Further Pearson correlations and regressions were conducted on these variables to examine their underlying associations between them.

Pearson Correlation Analysis

A Pearson correlation analysis was conducted to examine the relationships between social media usage, cognitive functioning, and attention control in young adults. The results revealed a significant positive correlation between social media usage (SMU) and cognitive failures (CFQ) ($r = .413$, $p < .001$), indicating that higher levels of social media usage were associated with more cognitive difficulties. Additionally, social media usage was significantly negatively correlated with attention control (ATTC) ($r = -.398$, $p < .001$), suggesting that increased social media usage is associated with reduced attention control. Furthermore, cognitive functioning was negatively correlated with attention control ($r = -.422$, $p < .001$), implying that individuals with greater cognitive difficulties tend to have poorer attention regulation.

Table 2. *Pearson Correlation Between Study Variables*

		CFQ	SMU	ATTC
CFQ	Pearson correlation	1	.413**	-.422**
	Sig. (2-tailed)		<.001	<.001
	N	130	130	130
SMU	Pearson correlation	.413**	1	-.398**
	Sig. (2-tailed)	<.001		<.001
	N	130	130	130
ATTC	Pearson correlation	-.422*	-.398**	1
	Sig. (2-tailed)	<.001	<.001	
	N	130	130	130

****Correlation is significant at the 0.01 level(2-tailed)**

Note. CFQ, Cognitive Failure Questionnaire; SMU, Social Media Usage Questionnaire; ATTC, Attention Control Scale.

Regression Analysis

A simple linear regression was performed to determine whether social media usage (SMU) significantly predicted cognitive functioning, as measured by the Cognitive Failures Questionnaire (CFQ). The model was statistically significant, $F(1, 128) = 26.34$, $p < .001$, explaining 17.1% of the variance in cognitive failures ($R^2 = .171$, Adjusted $R^2 = .164$). The regression coefficient for social media usage was positive and significant ($\beta = .413$, $p < .001$), with an unstandardized coefficient of $B = 1.025$. This indicates that higher social media usage is associated with greater reported cognitive failures in young adults. These findings support Hypothesis 1, suggesting that excessive social media engagement negatively impacts cognitive functioning.

Table 3. *Coefficients of Regression Model Predicting Cognitive Functioning*

Coefficients^a

	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	22.514	3.664		6.145	<.001
SMU	1.025	.200	.413	5.132	<.001

a. Dependent Variable: CFQ

Note. CFQ, Cognitive Failure Questionnaire; SMU, Social Media Usage Questionnaire.

A regression model was constructed to examine whether social media usage (SMU) predicted attention control (ATTC) in young adults. The results indicated that the model was statistically significant, $F(1, 128) = 24.10$, $p < .001$, and accounted for approximately 15.8% of the variance in attention control ($R^2 = .158$, Adjusted $R^2 = .152$). The regression coefficient for social media usage was significant ($\beta = -0.398$, $p < .001$), with a negative unstandardized coefficient ($B = -0.475$), indicating that higher levels of social media usage significantly predicted lower attention control. These findings further support Hypothesis 2, highlighting the adverse influence of increased social media use on young adults' ability to regulate their attention.

Table 4. *Coefficients of Regression Model Predicting Attention Control*

Coefficients^a

	Unstandardized Coefficients		Standardized coefficients		
Model	B	Std. Error	Beta	t	Sig.
(Constant)	36.936	1.773		20.830	<.001
SMU	-.475	.097	-.398	-4.909	<.001

a. Dependent Variable: ATTC

Note. SMU, Social Media Usage Questionnaire; ATTC, Attention Control Scale.

Evaluation of Hypotheses

The findings from the statistical analyses provide clear support for both proposed hypotheses.

Hypothesis 1

Excessive social media usage is negatively associated with cognitive functioning in young adults.

This hypothesis is supported by the results of both the Pearson correlation and regression analysis. The data revealed a significant positive correlation between social media usage and cognitive failures ($r = .413$, $p < .001$). This indicates that as social media usage increases, the frequency of reported cognitive lapses also rises.

Further reinforcing this relationship, the regression analysis showed that social media usage significantly predicted cognitive failure scores, with the model accounting for 17.1% of the variance ($R^2 = .171$, $p < .001$). These findings confirm that excessive engagement with social media is associated with diminished cognitive performance, thereby supporting the first hypothesis.

Hypothesis 2

Increased social media usage is associated with reduced attention span in young adults.

This hypothesis is also supported by the results. The Pearson correlation analysis demonstrated a significant negative correlation between social media usage and attention control ($r = -.398$, $p < .001$). This suggests that higher usage is linked to weaker attentional abilities.

Additionally, the linear regression analysis revealed that social media usage significantly predicted attention control scores, explaining 15.8% of the variance ($R^2 = .158$, $p < .001$). The negative regression coefficient indicates that as social media use increases, attention control decreases. These findings are consistent with the second hypothesis and highlight the potential cognitive cost of frequent social media engagement.

4. Conclusion

The rapid growth of social media in recent years has reshaped how adolescents interact, learn, and process information. While these platforms offer opportunities for communication and self-expression, they also raise concerns regarding their potential impact on mental and cognitive

health. The present study sets out to explore the relationship between social media usage and two core aspects of cognitive functioning: attention control and cognitive failures. By using standardized tools and statistical analysis, the study provides empirical support for the view that excessive social media engagement may impair important mental processes in adolescents. The findings clearly demonstrated that higher levels of social media usage are associated with more frequent cognitive errors and reduced ability to maintain focus. These results suggest that constant exposure to digital content, notifications, and multitasking online may strain the brain's attentional systems, making it harder for individuals to stay organized, remember tasks, and manage distractions effectively. Importantly, the study contributes to the existing body of research by focusing specifically on adolescents—a population that is particularly vulnerable to digital overexposure due to their developmental stage. The results support psychological theories that link overstimulation from digital media to cognitive overload and attentional fatigue. Although the effect sizes were moderate, they were statistically significant and consistent, reinforcing the idea that social media use plays a meaningful role in shaping cognitive outcomes. Moreover, the study opens the door for practical changes in how adolescents manage their digital habits. Whether through educational programs, parental guidance, or clinical interventions, there is a need to encourage balanced and mindful media consumption. These findings also emphasize the importance of further exploring how different types of social media content, usage patterns, and individual differences interact to influence cognition.

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