




The Relationship Between Impulsivity and Problematic Internet Use Mediated by Boredom Proneness in Adolescents

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ABSTRACT

Objective: This study aimed to investigate the relationship between impulsivity and problematic internet use in adolescents, with boredom proneness as a mediating variable.

Methods and Materials: A descriptive correlational design was employed, involving 450 Brazilian adolescents aged 13 to 18 years, selected using multistage cluster sampling. Data were collected through the Barratt Impulsiveness Scale – Version 11 (BIS-11), the Boredom Proneness Scale (BPS), and Young's Internet Addiction Test (IAT). Statistical analyses included Pearson correlation to examine bivariate associations, and Structural Equation Modeling (SEM) with maximum likelihood estimation in AMOS 21 to test the hypothesized mediation model. Model fit was assessed using χ^2 , χ^2/df , GFI, AGFI, CFI, RMSEA, and TLI indices.

Findings: Pearson correlation analyses revealed significant positive associations between impulsivity and boredom proneness ($r = .48$, $p < .001$), impulsivity and problematic internet use ($r = .42$, $p < .001$), and boredom proneness and problematic internet use ($r = .53$, $p < .001$). The SEM analysis indicated a good model fit ($\chi^2/df = 2.04$, GFI = 0.95, AGFI = 0.93, CFI = 0.97, RMSEA = 0.048, TLI = 0.96). Impulsivity significantly predicted boredom proneness ($\beta = 0.48$, $p < .001$) and problematic internet use both directly ($\beta = 0.22$, $p < .001$) and indirectly through boredom proneness ($\beta = 0.22$, $p < .001$), with the total effect being substantial ($\beta = 0.44$, $p < .001$). These findings confirm partial mediation, indicating that boredom proneness explains a significant portion of the link between impulsivity and problematic internet use.

Conclusion: The results highlight boredom proneness as a key mechanism linking impulsivity to problematic internet use among adolescents. Interventions aiming to reduce excessive internet use in this population should address both impulsive tendencies and the ability to tolerate boredom, fostering adaptive coping strategies in low-stimulation contexts.

Keywords: Impulsivity; boredom proneness; problematic internet use; adolescents

1. Introduction

Problematic internet use has emerged as a pressing behavioral concern among adolescents, particularly given the widespread accessibility of digital technologies and social media platforms. Defined as excessive or poorly controlled preoccupations, urges, or behaviors regarding internet use that lead to impairment or distress, problematic internet use encompasses a range of maladaptive behaviors, from compulsive social networking to online gaming and browsing. Scholars have identified boredom proneness—a stable individual tendency to experience boredom in a variety of contexts—as a critical psychological factor linked to problematic internet behaviors (Aquino & Kimong, 2022). Adolescence, characterized by heightened novelty-seeking and sensitivity to peer influence, is a developmental stage particularly vulnerable to these dynamics, making the study of boredom proneness and its potential mediating role in the relationship between impulsivity and problematic internet use both timely and essential.

Boredom proneness has been extensively studied as both a predictor and a mediator in various maladaptive digital behaviors. Empirical findings indicate that individuals with high boredom proneness often use online activities as a coping mechanism to alleviate feelings of monotony, potentially fostering addictive use patterns (Cannito et al., 2023). This aligns with research linking trait boredom to greater attentional bias toward social networking platforms, which in turn exacerbates compulsive internet engagement. Furthermore, boredom proneness shares significant conceptual and empirical overlap with impulsivity, as both involve difficulty sustaining attention and regulating behavior in the face of environmental stimuli (Chandran et al., 2023). In adolescents, this combination may be particularly detrimental, as the developing prefrontal cortex limits executive control, heightening the risk for problematic online behaviors.

In academic settings, boredom has been shown to influence engagement and attentional focus. For example, perceived teacher enthusiasm and perceived task value can mitigate class-related boredom among students, illustrating the environmental and cognitive dimensions of the construct (Cui et al., 2021). However, outside the classroom, boredom proneness may predispose adolescents to seek immediate gratification through internet use, thereby creating a pathway to excessive or maladaptive consumption. Evidence also suggests that boredom proneness interacts with other psychosocial constructs, such as fear of missing out, to

predict behaviors like “phubbing” (snubbing others in favor of one’s phone) (Ding & Si, 2024). This interaction underscores boredom proneness as both a risk factor and a psychological process connecting various predictors to problematic internet use.

Recent work has expanded the scope of boredom proneness research into related online behaviors, such as compulsive online shopping, where maladaptive metacognitions partly explain the link between boredom and excessive consumption (Fioravanti et al., 2024). Similarly, studies on “phubbing” behaviors have identified boredom proneness as a significant contributor, mediated through variables like online vigilance and fear of missing out (Gao et al., 2023; Lv & Wang, 2023). These findings reveal a consistent pattern: boredom-prone individuals are more susceptible to compulsive and avoidance-based internet behaviors. Importantly, boredom proneness is not merely situational but trait-like, reflecting enduring tendencies that shape how individuals respond to various life contexts (Hsu et al., 2025). In youth with attention-deficit/hyperactivity disorder (ADHD), for example, boredom proneness has been linked to inattention through mechanisms such as delay aversion, suggesting broader implications for cognitive and behavioral regulation.

The role of impulsivity in this relationship cannot be overstated. Impulsivity, broadly defined as a predisposition toward rapid, unplanned reactions without considering negative consequences, has been consistently linked to addictive behaviors, including problematic internet use (Kim & Choi, 2025). Adolescents high in impulsivity are more likely to seek immediate rewards and have difficulty delaying gratification, making the internet—with its constant availability of novel stimuli—an attractive outlet. When coupled with boredom proneness, impulsivity may amplify the risk of overuse, as individuals not only seek stimulation but also fail to inhibit their engagement with online platforms. Studies have demonstrated that impulsive individuals tend to adopt faster “life history” strategies, prioritizing short-term gains over long-term benefits, which can manifest in their online activity patterns (Senyk et al., 2024).

The proliferation of short-form video platforms has also intensified concerns around boredom proneness and impulsivity. Research on problematic short-video use shows that symptoms of ADHD, particularly hyperactivity–impulsivity, are closely linked to such behaviors, with boredom proneness emerging as a potential explanatory factor (Xu et al., 2025). This is consistent with findings that

social exclusion can increase short video addiction through heightened boredom and reduced self-control (Zhang et al., 2024). Similarly, negative life events have been shown to drive problematic online gaming through a boredom-related regulatory process (Zhenyu et al., 2024), highlighting the mediating role of boredom proneness in multiple digital domains.

Boredom proneness has also been found to mediate between loneliness and mobile phone addiction (Li, Feng, et al., 2021; Li, Zhou, et al., 2021), as well as between anxiety and smartphone addiction (Zhang et al., 2023). These mediation effects suggest that boredom proneness serves as a psychological bridge between various emotional states and maladaptive technology use. Relatedly, bedtime procrastination—a behavior often linked to late-night internet use—has been explained through sequential mediation models involving boredom proneness, mobile phone addiction, and negative emotions (Zhu et al., 2023). These converging lines of evidence position boredom proneness as a transdiagnostic vulnerability factor, relevant across a wide array of maladaptive digital behaviors.

Furthermore, personality and emotional processing factors may heighten susceptibility to boredom-driven internet use. Alexithymia, or difficulty identifying and describing feelings, has been found to predict internet novel addiction through boredom proneness (Liu et al., 2022). This suggests that individuals with poor emotional awareness may turn to the internet as a substitute for internal engagement, especially when prone to boredom. Likewise, future time perspective has been negatively associated with internet dependence, with boredom proneness moderating these effects during the pandemic (Liu et al., 2023).

While boredom proneness is often implicated as a mediator, it is equally important to consider its direct effects. Studies on online deviant behaviors, for example, have found that boredom proneness predicts such behaviors through mechanisms like rumination, with gender serving as a moderator (Zhao et al., 2022). Additionally, online procrastination behaviors have been shown to be predicted by boredom proneness, self-control deficits, and impulsivity, emphasizing the interplay between personality traits and behavioral regulation (Sümer & Büttner, 2022). Notably, loneliness combined with reduced self-control exacerbates problematic smartphone use in adolescents, further illustrating the multi-determined nature of these outcomes (Maftei et al., 2024).

This body of literature collectively supports a conceptual model in which impulsivity serves as an antecedent,

boredom proneness functions as a mediator, and problematic internet use emerges as the outcome. Impulsivity provides the behavioral predisposition toward rapid engagement, boredom proneness offers the motivational drive for seeking stimulation, and the digital environment supplies the readily available means for fulfillment. By integrating these constructs within a single model, it becomes possible to better understand the pathways leading to maladaptive internet behaviors in adolescents, thereby informing both preventative and intervention strategies.

The present study aims to investigate the relationship between impulsivity and problematic internet use in adolescents, with boredom proneness as a mediating variable.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a descriptive correlational design to examine the relationship between impulsivity and problematic internet use mediated by boredom proneness in adolescents. The target population consisted of secondary school students from Brazil. Using Morgan and Krejcie's (1970) sample size determination table, a minimum sample of 384 was required for the population size; however, to ensure greater statistical power and account for potential incomplete responses, a total of 450 participants were recruited. Inclusion criteria were: being between the ages of 13 and 18 years, current enrollment in secondary education, and regular internet usage (defined as at least one hour per day). Exclusion criteria included diagnosed neurological disorders or psychiatric conditions that could affect cognitive function. Participants were selected through a multistage cluster sampling method, with schools randomly chosen from different regions and classes selected proportionally to school size. Data were collected using standardized self-report questionnaires administered during school hours in the presence of trained researchers, following ethical approval and informed consent procedures.

2.2. Measures

The Boredom Proneness Scale (BPS), developed by Farmer and Sundberg in 1986, was used to assess the tendency of individuals to experience boredom across various situations. The scale contains 28 items rated on a 7-point Likert scale ranging from 1 ("strongly disagree") to 7 ("strongly agree"), with higher scores indicating greater

prone to boredom. It comprises two subscales: External Stimulation (reflecting the need for environmental novelty and change) and Internal Stimulation (reflecting difficulties in self-generating engagement and interest). Total scores are calculated by summing item responses, with some items reverse scored. Previous studies have confirmed the scale's high internal consistency, with Cronbach's alpha typically exceeding 0.80, as well as good test-retest reliability and construct validity in adolescent populations.

Impulsivity was measured using the Barratt Impulsiveness Scale – Version 11 (BIS-11), developed by Patton, Stanford, and Barratt in 1995. This widely used self-report instrument contains 30 items scored on a 4-point Likert scale from 1 (“rarely/never”) to 4 (“almost always/always”), assessing the frequency of impulsive behaviors and thoughts. The BIS-11 includes three second-order subscales—Attentional Impulsivity, Motor Impulsivity, and Non-Planning Impulsivity—which together form an overall impulsivity score. Higher scores indicate greater impulsivity. Extensive psychometric evaluations have demonstrated satisfactory internal consistency (Cronbach's alpha values generally above 0.78), good temporal stability, and strong convergent and discriminant validity across adolescent and adult samples.

Problematic internet use was assessed using the Young's Internet Addiction Test (IAT), developed by Young in 1998. The IAT is a 20-item self-report measure designed to evaluate the degree of internet overuse and its impact on daily life. Items are rated on a 5-point Likert scale from 1 (“rarely”) to 5 (“always”), yielding a total score ranging from 20 to 100, with higher scores indicating more severe problematic internet use. The instrument covers key dimensions such as compulsive use, escapism, neglect of duties, and emotional attachment to online activities, but is scored as a single composite scale without subscales. The IAT has been validated in numerous cultural contexts, with

strong internal consistency (Cronbach's alpha typically exceeding 0.85), excellent test-retest reliability, and confirmed construct validity in adolescent populations.

2.3. Data Analysis

Data were analyzed using both descriptive and inferential statistics. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were calculated for demographic variables and main study constructs. Pearson correlation coefficients were computed using SPSS version 27 to determine the bivariate associations between boredom proneness (dependent variable) and each independent variable (impulsivity and problematic internet use). Furthermore, the hypothesized mediation model was tested using Structural Equation Modeling (SEM) in AMOS version 21, employing the maximum likelihood estimation method. Model fit was evaluated using multiple fit indices, including the chi-square statistic (χ^2), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Significance levels were set at $p < 0.05$ for all analyses.

3. Findings and Results

Of the 450 adolescents who participated in the study, 218 (48.4%) were male and 232 (51.6%) were female. The participants' ages ranged from 13 to 18 years, with a mean age of 15.46 years ($SD = 1.42$). Regarding grade level, 94 students (20.9%) were in the first year of secondary school, 151 (33.6%) were in the second year, and 205 (45.6%) were in the third year. In terms of daily internet use, 57 participants (12.7%) reported using the internet for 1–2 hours per day, 146 (32.4%) for 3–4 hours, 169 (37.6%) for 5–6 hours, and 78 (17.3%) for more than 6 hours.

Table 1

Descriptive Statistics for Study Variables (n = 450)

Variable	Mean	SD
Impulsivity	66.84	8.47
Boredom proneness	122.36	14.52
Problematic internet use	57.93	11.18

Participants reported moderately high levels of impulsivity ($M = 66.84$, $SD = 8.47$) on the BIS-11 scale. The mean boredom proneness score was 122.36 ($SD = 14.52$), indicating a tendency toward frequent experiences of

boredom. Problematic internet use showed a mean score of 57.93 ($SD = 11.18$), suggesting that a substantial proportion of the sample exhibited moderate to high problematic use behaviors (Table 1).

Prior to conducting the main analyses, the assumptions for Pearson correlation and Structural Equation Modeling were examined. For normality, skewness values ranged from -0.41 to 0.67 and kurtosis values ranged from -0.53 to 0.74 , all within the acceptable range of ± 2 . The Shapiro–Wilk test was nonsignificant for boredom proneness ($W = 0.991$, $p = 0.072$) and impulsivity ($W = 0.993$, $p = 0.115$), but was significant for problematic internet use ($W = 0.987$, $p = 0.041$); however, given the large sample size, visual inspection of Q–Q plots confirmed approximate normality.

Linearity and homoscedasticity were verified through scatterplots of residuals, showing no systematic patterns. Multicollinearity was assessed using Variance Inflation Factors (VIF), which ranged from 1.12 to 1.38 , well below the threshold of 10 . Outliers were checked via Mahalanobis distance, with no cases exceeding the critical χ^2 value at $p < 0.001$ for the given degrees of freedom. These results confirmed that all statistical assumptions were adequately met.

Table 2

Pearson Correlations Between Study Variables (n = 450)

Variable	1	2	3
1. Impulsivity	—		
2. Boredom proneness	.48 ($p < .001$)	—	
3. Problematic internet use	.42 ($p < .001$)	.53 ($p < .001$)	—

Correlation analyses revealed significant positive associations between impulsivity and boredom proneness ($r = .48$, $p < .001$), impulsivity and problematic internet use ($r = .42$, $p < .001$), and boredom proneness and problematic internet use ($r = .53$, $p < .001$). These results indicate that

higher impulsivity is related to greater boredom proneness and higher problematic internet use, and that boredom proneness is strongly associated with problematic internet use (Table 2).

Table 3

Fit Indices for the Structural Equation Model

Fit Index	Value
χ^2	126.38
df	62
χ^2/df	2.04
GFI	0.95
AGFI	0.93
CFI	0.97
RMSEA	0.048
TLI	0.96

The model demonstrated an acceptable fit to the data, $\chi^2(62) = 126.38$, $\chi^2/df = 2.04$, GFI = 0.95, AGFI = 0.93, CFI = 0.97, RMSEA = 0.048, and TLI = 0.96. These indices meet

commonly accepted thresholds for good model fit, indicating that the proposed mediation model adequately represents the observed data (Table 3).

Table 4

Total, Direct, and Indirect Path Coefficients Between Study Variables

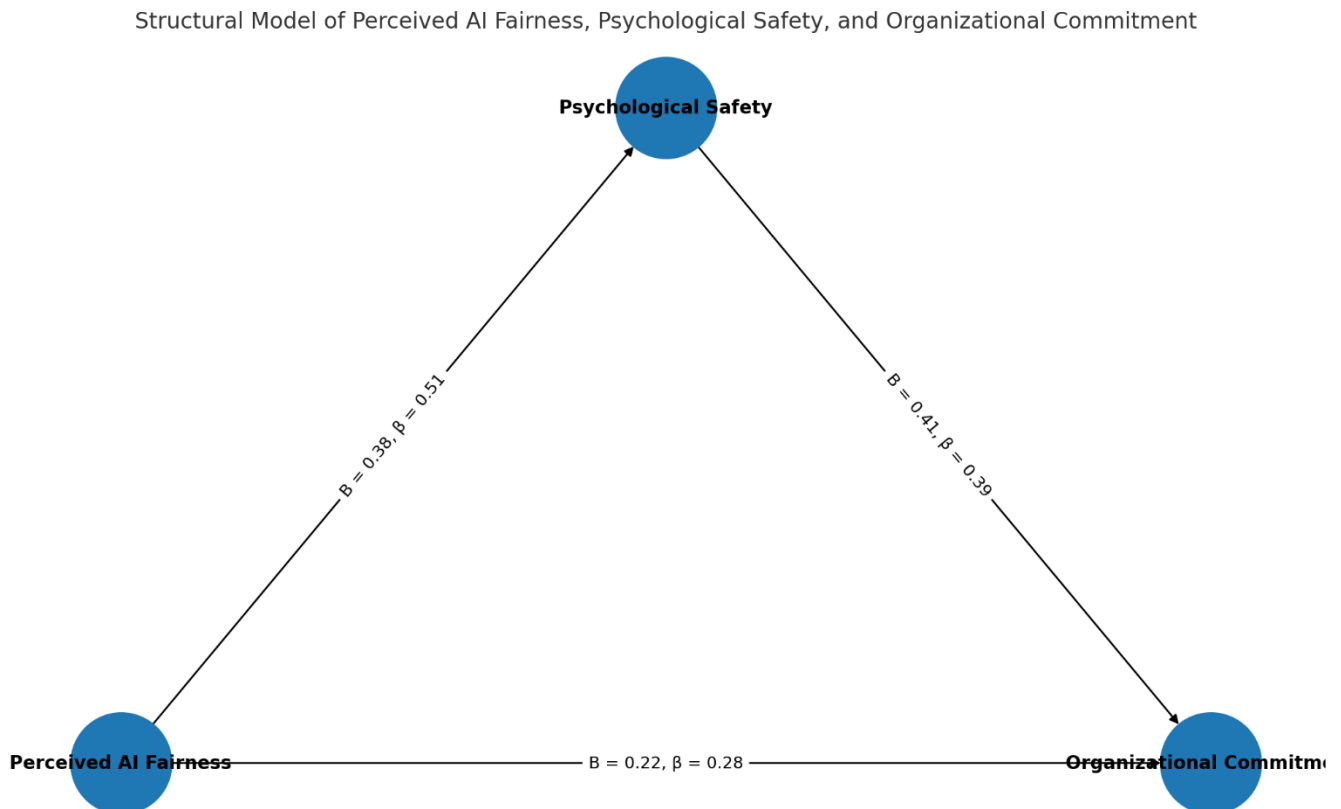
Path	b	SE	Beta	p
Impulsivity → Boredom proneness (direct)	0.82	0.09	0.48	$< .001$
Boredom proneness → Problematic internet use (direct)	0.41	0.05	0.46	$< .001$
Impulsivity → Problematic internet use (direct)	0.29	0.07	0.22	$< .001$
Impulsivity → Problematic internet use (indirect via boredom proneness)	0.34	0.04	0.22	$< .001$
Impulsivity → Problematic internet use (total)	0.63	0.06	0.44	$< .001$

The SEM results indicated that impulsivity had a significant direct effect on boredom proneness ($b = 0.82$, $SE = 0.09$, $\beta = 0.48$, $p < .001$) and that boredom proneness had a significant direct effect on problematic internet use ($b = 0.41$, $SE = 0.05$, $\beta = 0.46$, $p < .001$). Impulsivity also directly predicted problematic internet use ($b = 0.29$, $SE = 0.07$, $\beta = 0.22$, $p < .001$). Importantly, the indirect effect of impulsivity

on problematic internet use via boredom proneness was significant ($b = 0.34$, $SE = 0.04$, $\beta = 0.22$, $p < .001$), confirming partial mediation. The total effect of impulsivity on problematic internet use (direct plus indirect) was substantial ($b = 0.63$, $SE = 0.06$, $\beta = 0.44$, $p < .001$), supporting the hypothesized model (Table 4).

Figure 1

Structural Model of The Study



4. Discussion and Conclusion

The findings of this study revealed a significant positive relationship between impulsivity and problematic internet use among adolescents, with boredom proneness playing a partial mediating role. Specifically, higher levels of impulsivity were associated with greater proneness to boredom, which in turn was linked to higher problematic internet use. This pattern supports the theoretical framework in which impulsivity serves as a dispositional factor that increases susceptibility to situational triggers like boredom, ultimately leading to maladaptive digital behaviors. The mediation effect suggests that impulsive adolescents are not only more prone to acting without forethought but also more

vulnerable to feelings of monotony, which they may attempt to alleviate through excessive internet engagement.

These results align closely with existing literature that highlights boredom proneness as a pivotal psychological mechanism in problematic technology use. For instance, previous research has shown that boredom proneness significantly predicts compulsive social network use through attentional biases, indicating that bored individuals may be drawn to online environments offering constant novelty (Cannito et al., 2023). The present findings extend this understanding to a broader adolescent population, suggesting that the same attentional processes might underlie a general pattern of problematic internet use rather than being confined to specific platforms. Furthermore, the

observed link between impulsivity and boredom proneness echoes findings in emerging adults, where impulsivity correlates with greater difficulty tolerating low-stimulation environments (Chandran et al., 2023).

The mediation role of boredom proneness is also consistent with studies showing that situational boredom in academic contexts can be shaped by motivational factors and, in turn, influence engagement behaviors (Cui et al., 2021). Translating this to the digital context, impulsive individuals may perceive online activities as highly valuable tasks that relieve boredom, reinforcing usage patterns. Moreover, the current findings align with research demonstrating that boredom proneness interacts with fear of missing out to predict “phubbing” behaviors (Ding & Si, 2024), underscoring the tendency of boredom-prone individuals to prioritize digital interaction over face-to-face engagement. This dynamic may explain why impulsive adolescents with high boredom proneness gravitate toward online environments, where social gratification is immediate and abundant.

The relationship between boredom proneness and other compulsive online behaviors also reinforces the plausibility of the mediation model. For example, maladaptive metacognitions have been identified as a key mechanism linking boredom proneness to compulsive online shopping (Fioravanti et al., 2024). Similarly, the multiple mediation model proposed in studies on phubbing shows that boredom proneness can operate through multiple social-cognitive pathways, including online vigilance (Gao et al., 2023; Lv & Wang, 2023). These converging findings indicate that boredom proneness is not a simple predictor but a multifaceted process variable that connects personality traits, such as impulsivity, to various maladaptive digital outcomes.

The present findings also resonate with work linking boredom proneness to inattention and delay aversion in youth with ADHD (Hsu et al., 2025). This suggests that impulsive tendencies, whether or not formally diagnosed as ADHD, may predispose individuals to boredom, which then facilitates problematic internet behaviors. Furthermore, the association between impulsivity and a faster life history strategy (Kim & Choi, 2025) supports the notion that impulsive adolescents may prioritize short-term stimulation over long-term well-being, rendering them more susceptible to internet overuse when bored.

From the perspective of digital media environments, the current results are in line with evidence that hyperactivity–impulsivity symptoms are directly associated with

problematic short-video use (Xu et al., 2025). The mediation by boredom proneness parallels findings that social exclusion fosters short video addiction via boredom and reduced self-control (Zhang et al., 2024). Moreover, similar mechanisms have been documented in online gaming, where negative life events predict problematic gaming through boredom-related regulation (Zhenyu et al., 2024). Together, these studies support a cross-domain relevance of boredom proneness in mediating between impulsivity-linked vulnerabilities and problematic digital engagement.

Our findings also find strong parallels with research demonstrating that boredom proneness mediates the association between loneliness and mobile phone addiction (Li, Feng, et al., 2021; Li, Zhou, et al., 2021). The implication is that boredom proneness may serve as a generalized psychological bridge connecting various negative emotional or dispositional states—including impulsivity—to excessive technology use. Additionally, the sequential mediation documented in bedtime procrastination research (Zhu et al., 2023) mirrors the structure of the current model, reinforcing the role of boredom proneness in linking predispositions to maladaptive digital habits.

The emotional regulation perspective also offers explanatory value. For instance, alexithymia has been shown to predict internet novel addiction through boredom proneness (Liu et al., 2022), suggesting that deficits in emotional awareness or regulation can exacerbate the boredom–internet use link. Similarly, future time perspective has been found to reduce internet dependence, with boredom proneness acting as a moderator during periods of restricted offline activity (Liu et al., 2023). These studies indicate that boredom proneness not only mediates but also moderates the effects of personality and cognitive variables on technology use, highlighting its complex role in behavioral regulation.

Additional support for our mediation findings comes from research on online deviant behaviors, where boredom proneness predicted such behaviors through rumination, with gender as a moderator (Zhao et al., 2022). The interplay between boredom proneness, self-control, and impulsivity in predicting online procrastination (Sümer & Büttner, 2022) also mirrors the multi-variable pathways observed in the present study. Finally, work on adolescent smartphone use has shown that loneliness and low self-control exacerbate problematic usage, with boredom proneness acting as a contributing factor (Maftei et al., 2024). This convergence of evidence across domains strengthens confidence in our

finding that boredom proneness mediates between impulsivity and problematic internet use.

Collectively, these studies and the present findings underscore that boredom proneness is a key mechanism linking impulsivity to problematic internet behaviors in adolescents. The implication is that interventions aimed at reducing problematic internet use should consider targeting boredom proneness, particularly among highly impulsive youth. Strategies that increase tolerance for low-stimulation environments, foster intrinsic motivation, and enhance self-regulation may disrupt the cycle connecting impulsivity, boredom, and excessive digital engagement.

5. Limitations & Suggestions

This study has several limitations that should be considered when interpreting the results. First, the cross-sectional design precludes causal inferences regarding the relationships among impulsivity, boredom proneness, and problematic internet use. While the mediation model is theoretically grounded and supported by prior research, longitudinal or experimental designs are necessary to establish temporal precedence. Second, all measures relied on self-report questionnaires, which may be subject to social desirability bias or inaccuracies in self-assessment. Third, the sample consisted exclusively of Brazilian adolescents, which may limit the generalizability of the findings to other cultural contexts where digital media use patterns and social norms differ. Fourth, the study did not account for potential confounding variables such as socio-economic status, academic performance, or comorbid psychological conditions, which may influence both impulsivity and internet use behaviors. Finally, the study examined boredom proneness as a unitary construct, without exploring potential subdimensions that could differentially mediate the impulsivity–internet use relationship.

Future research should employ longitudinal designs to clarify the causal pathways linking impulsivity, boredom proneness, and problematic internet use. Experimental studies that manipulate boredom or stimulation levels could provide further insight into the mechanisms at play. Expanding the scope to include cross-cultural comparisons would allow examination of how cultural norms and technological ecosystems influence these relationships. Researchers should also investigate additional mediators and moderators, such as self-control, emotional regulation, or peer influence, to develop a more nuanced understanding of the impulsivity–internet use link. Using multi-method

assessment approaches, including behavioral tasks and informant reports, could reduce reliance on self-report data. Finally, exploring the distinct roles of internal and external boredom proneness could shed light on more targeted intervention strategies.

Practitioners working with adolescents should consider integrating boredom management strategies into digital wellness and self-regulation programs. Teaching adolescents to recognize and cope with boredom adaptively may help reduce reliance on the internet for stimulation. Interventions that strengthen self-regulatory capacities, such as mindfulness training or executive function exercises, could be particularly beneficial for impulsive youth. Schools and parents should collaborate to provide adolescents with engaging offline activities that fulfill their need for novelty and social interaction. Additionally, screening for high impulsivity and boredom proneness could help identify individuals at greater risk for problematic internet use, allowing for early preventive measures.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

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