

Modeling Internet Addiction: Examining the Impact of Parenting Styles and Psychological Control with the Mediating Roles of Media Literacy and Cognitive Emotion Regulation

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Abstract

Introduction: The purpose of this study was to develop a predictive model of Internet addiction among high school students in Kermanshah. It is based on parenting styles as well as psychological control, with the mediating role of media literacy and cognitive emotion regulation.

Method: The present study is a quantitative-methods. The 384 high school students in Kermanshah were selected using a multi-stage cluster sampling method and the research instruments completed by the students in the academic year 1402-1403 included the following items: Baumrind's Parenting Styles Inventory, Young's Internet Addiction Questionnaire, Tammen's Media Literacy Questionnaire, Soenens et al.'s Parental Psychological Control Scale, and Garnefski and Kraaij's Cognitive Emotion Regulation Questionnaire. Path analysis and inferential statistics were employed to analyze the proposed model using SPSS and SMARTPLS software.

Results: The results revealed that parenting styles directly predict Internet addiction ($\beta = 0.420$, $P < 0.05$), with authoritative and permissive styles showing a stronger protective effect. Cognitive emotion regulation significantly mediated this relationship ($\beta = 0.235$, $P < 0.05$), indicating that better emotion regulation reduces the risk of addiction. However, psychological control did not directly predict Internet addiction ($\beta = 0.104$, $P > 0.05$) but had an indirect effect through cognitive emotion regulation ($\beta = 0.520$, $P < 0.05$). Media literacy, while not a direct predictor ($\beta = 0.117$, $P > 0.05$), mediated the relationship between parenting styles and Internet addiction, suggesting that higher media literacy promotes healthier Internet use.

Conclusion: Given that there is a relationship between Internet addiction, emotional regulation and parenting styles, developing family interactions and strengthening the parent-child relationships can create a sense of support and security. Therefore, families can reduce time spent on the Internet by promoting and encouraging alternative activities such as engaging in artistic activities, reading books, or participating in community-based projects.

Keywords: Internet Addiction, Parenting Style, Psychological Control, Media Literacy, Cognitive Emotion Regulation, Adolescents, Path Analysis, Predictive Modeling, Structural Equation Modeling (SEM)

Introduction

The rapid proliferation of the Internet and smartphones has transformed how individuals communicate, learn, and entertain themselves. Globally, approximately 66% of the world's population uses the Internet, with adolescents being among the most active users. There are no sources in the current document. In 2023, it was reported that 92% of adolescents in developed countries and 75% in developing regions have regular access to

the Internet [1]. While this connectivity offers unprecedented opportunities for education and socialization, it also raises significant concerns about excessive and problematic Internet use. Internet addiction, characterized by compulsive use, loss of control, and negative consequences in daily functioning, has emerged as a critical public health issue, particularly among adolescents [2, 3]. The societal and educational implications of Internet addiction are profound. Studies indicate that adolescents with Internet addiction are more likely to experience academic underachievement, social isolation, and mental health issues such as anxiety and depression [4]. For instance, a meta-analysis revealed that 15% of adolescents globally exhibit symptoms of Internet addiction, with higher prevalence rates in Asia (20%) compared to Europe (10%) and North America (12%) [5]. In Iran, where this study is conducted, recent surveys report that 25% of high school students exhibit signs of Internet addiction, highlighting the urgency of addressing this issue in the region [6]. These statistics underscore the need for a deeper understanding of the factors contributing to Internet addiction and the development of effective interventions.

Theoretical Framework: Interconnected Factors Influencing Internet Addiction

To address the complexities of Internet addiction, it is essential to examine the interplay of individual, familial, and environmental factors. Parenting styles, parental psychological control, media literacy, and cognitive emotion regulation are key constructs that have been independently linked to Internet addiction. However, their interconnectedness remains underexplored, creating a gap in the literature.

1. **Parenting Styles and Psychological Control:** Parenting styles, categorized into authoritarian, permissive, authoritative, and neglectful, significantly influence adolescents' Internet use patterns [7]. Authoritarian parenting, characterized by strict rules and low emotional warmth, often drives adolescents to seek escape through excessive Internet use [8]. Conversely, authoritative parenting, which balances warmth and discipline, promotes healthier Internet habits [9]. Parental psychological control, involving manipulative behaviors such as guilt induction and love withdrawal, exacerbates the risk of Internet addiction by fostering emotional distress and a lack of autonomy [10].
2. **Media Literacy:** Media literacy, defined as the ability to critically analyze and interpret media content, plays a protective role against Internet addiction [11]. Adolescents with higher media literacy are better equipped to navigate online risks, discern misinformation, and regulate their Internet use [12]. However, the generational gap in Internet usage between parents and adolescents often limits parents' ability to guide their children effectively, further emphasizing the need for media literacy education [13].
3. **Cognitive Emotion Regulation:** Cognitive emotion regulation refers to the strategies individuals use to

manage negative emotions. Adaptive strategies, such as positive reappraisal and planning, are associated with healthier coping mechanisms, while maladaptive strategies, such as rumination and catastrophizing, are linked to Internet addiction [14]. Adolescents who rely on maladaptive strategies are more likely to use the Internet as an emotional escape, perpetuating a cycle of addiction [15].

Parenting styles set the tone for the emotional and behavioral environment in which adolescents develop [16]. Authoritarian parenting (strict rules, low warmth) and parental psychological control (manipulative behaviors like guilt induction) create an emotionally restrictive environment. This can lead to feelings of inadequacy, low autonomy, and emotional distress in adolescents [17]. Authoritative parenting (warmth combined with discipline) fosters a supportive environment, encouraging healthy emotional regulation and responsible Internet use [18]. These parenting behaviors directly influence adolescents' cognitive emotion regulation strategies. Adolescents raised in psychologically controlling environments may develop maladaptive emotion regulation strategies (e.g., rumination, catastrophizing) as they struggle to cope with emotional distress. In contrast, adolescents raised in authoritative environments are more likely to develop adaptive strategies (e.g., positive reappraisal, planning), which help them manage emotions without resorting to excessive Internet use [19]. Cognitive emotion regulation acts as a bridge between parenting styles/psychological control and Internet addiction [20]. Adolescents who rely on maladaptive strategies (e.g., rumination, emotional suppression) are more likely to use the Internet as a coping mechanism to escape negative emotions [21]. This creates a feedback loop where excessive Internet use further exacerbates emotional distress, leading to addiction. Conversely, adolescents with adaptive strategies are better equipped to handle stress and negative emotions without relying on the Internet, reducing the risk of addiction [22]. Parenting styles and psychological control shape these strategies, making them a critical mediator in the pathway to Internet addiction. Media literacy interacts with both parenting styles and cognitive emotion regulation [23]. Adolescents with high media literacy are better able to critically evaluate online content, recognize risks, and regulate their Internet use [24]. This skill can mitigate the negative effects of poor parenting or maladaptive emotion regulation. However, the generational gap in media literacy between parents and adolescents often limits parents' ability to guide their children effectively. This gap can be particularly problematic in families with authoritarian or psychologically controlling parents, as these parents may lack the knowledge to model or teach healthy Internet habits. Media literacy education can serve as a protective factor, empowering adolescents to navigate the Internet responsibly even in the absence of parental guidance. These relationships have been illustrated in Figure 1.

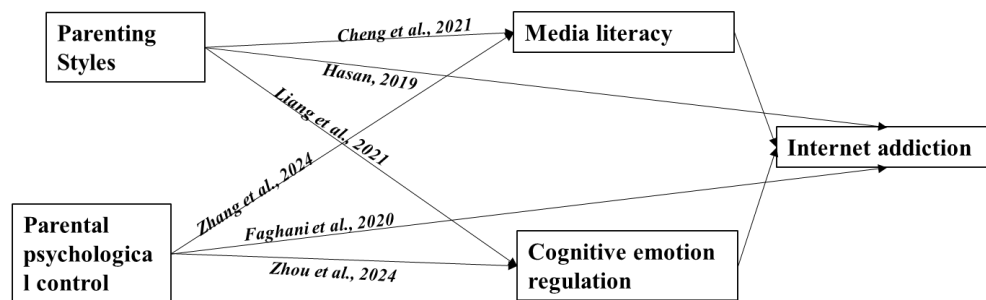


Figure 1. The proposed model [4, 25-29].

Despite the growing body of research on Internet addiction, significant gaps remain. Most studies have examined individual factors in isolation, such as parenting styles or cognitive emotion regulation, without considering their interconnectedness [18, 30-33]. Furthermore, there is a lack of comprehensive models that integrate familial and individual factors to predict Internet addiction. This study addresses these gaps by proposing a multivariate model that examines the mediating roles of media literacy and cognitive emotion regulation in the relationship between parenting styles, parental psychological control, and Internet addiction.

Based on the theoretical framework, the following hypotheses are proposed:

1. Authoritarian and neglectful parenting styles will positively predict Internet addiction, while authoritative parenting will negatively predict it.
2. Parental psychological control will be positively associated with Internet addiction.
3. Media literacy and adaptive cognitive emotion regulation strategies will mediate the relationship between parenting styles, psychological control, and Internet addiction.
4. Maladaptive cognitive emotion regulation strategies will exacerbate the relationship between negative parenting practices and Internet addiction.

This study aims to contribute to the literature by providing a holistic understanding of the factors influencing Internet addiction among adolescents. By examining the interplay of parenting styles, psychological control, media literacy, and cognitive emotion regulation, the findings will offer valuable insights for developing targeted interventions. The study focuses on high school students in Kermanshah, Iran, a region with high Internet usage rates and limited research on this topic. The results are expected to have broader applicability to other populations with similar socio-cultural contexts.

Method

The present study employs a quantitative-methods design to develop and test a predictive model for Internet addiction among adolescents. The study is applied in nature, aiming to provide actionable insights for addressing Internet addiction in educational and familial contexts.

The statistical population of this study comprised all male and female secondary school students in Kermanshah during the academic year 2023-2024, totaling 9,000 students as reported by the Ministry of Education. A

multi-stage cluster sampling method was employed to select the sample. This approach was chosen for its practicality and efficiency in large, geographically dispersed populations. Kermanshah's secondary schools were divided into clusters based on geographic location and school type (public vs. private). Random sampling was then applied within each cluster to ensure representativeness. The sample size was estimated using Cochran's formula, resulting in 384 participants. This sample size is statistically adequate for structural equation modeling (SEM) and ensures generalizability to the broader population of Kermanshah's secondary school students. The demographic and educational diversity of Kermanshah, including urban and rural schools, was considered to enhance the representativeness of the sample. This approach ensures that the findings are relevant to the region's unique socio-cultural and educational context.

The study utilized standardized questionnaires to measure the key variables. The selection of each instrument was guided by its alignment with the research objectives, established reliability and validity, and adaptability to the cultural context of Kermanshah.

The tools used in this study were as follows:

Internet Addiction Test: Young's Internet Addiction Test (IAT) [34]. was used to measure this variable. The IAT consists of 20 items scored on a 5-point Likert scale, assessing various dimensions of Internet addiction. It has demonstrated high internal reliability ($\alpha = 0.92$) and validity across diverse populations [24, 35]. In Iran, the IAT has been validated by Ghasemzadeh et al. (reliability = 0.88) and Alavi et al. (content and discriminant validity confirmed) [36, 37]. Its use in this study is justified by its comprehensive assessment of Internet addiction and its proven applicability in Iranian contexts.

Parenting Styles: The Parenting Styles Questionnaire [38]. was employed to assess authoritarian, permissive, and authoritative parenting styles. This 30-item tool has demonstrated high reliability ($\alpha = 0.89$) and discriminant validity [21]. Its selection is based on its ability to capture the nuanced dimensions of parenting styles relevant to adolescent behavior.

Parental Psychological Control: The Parental Psychological Control Questionnaire by Sonnens et al. [39]. was used to measure this variable. The 16-item tool assesses dependency-oriented and achievement-oriented psychological control. Its reliability ($\alpha = 0.88$) and validity have been confirmed in Iranian studies [40], making it suitable for this research.

Media Literacy: The 59-item Media Literacy Questionnaire by Tamman [7] was administered. This tool evaluates three dimensions: Consumption Patterns, Message Characteristics, and Message Critique. Its reliability ($\alpha = 0.82$) and face validity have been established in prior research [41], and its use aligns with the study's focus on critical media engagement.

Cognitive Emotion Regulation Questionnaire (CERQ): The Cognitive Emotion Regulation Questionnaire (CERQ) by Garnefski et al. [42] was used to measure adaptive and maladaptive emotion regulation strategies. The 18-item tool has demonstrated high reliability ($\alpha = 0.73$ – 0.80 for subscales) and validity [29]. Its selection is justified by its comprehensive assessment of emotion regulation strategies relevant to Internet addiction.

All instruments were translated into Persian and adapted for cultural relevance through back-translation and pilot testing with a small sample of students. This ensured that the tools were contextually appropriate and easily understood by participants. The questionnaires were distributed among the sample participants, and efforts were made to ensure the rights and well-being of participants. Informed consent was obtained from both students and their parents prior to data collection. Participants were assured of the confidentiality of their responses, and data were anonymized to protect their identities. Additionally, participants were informed of their right to withdraw from the study at any time without consequences.

Data were analyzed using SPSS 26 for descriptive statistics and preliminary analyses, and SMARTPLS 3.8 for structural equation modeling (SEM). SEM was chosen for its ability to simultaneously examine complex relationships

between multiple variables and test the overall model fit. This approach aligns with the study's objective of developing a predictive model for Internet addiction. The use of SMARTPLS was justified by its suitability for handling smaller sample sizes and its robustness in analyzing complex models with latent variables.

Results

The findings in this section will be presented in four subsections. These subsections include: (1) descriptive statistics, (2) direct effects of parenting styles and psychological control on Internet addiction, (3) indirect effects mediated by cognitive emotion regulation and media literacy, and (4) model fit and predictive power. This structure ensures clarity and facilitates a comprehensive understanding of the results.

The study sample consisted of 384 students, including 251 males (65.35%) and 133 females (34.64%). The age distribution was as follows: 88 students (22.92%) aged 13–14, 104 students (27.08%) aged 15–16, and 192 students (50%) aged 17–18. Table 1 presents the descriptive statistics (mean, standard deviation, skewness, and kurtosis) for each variable and its subscales.

All variables were tested for normality using the Kolmogorov-Smirnov test, which confirmed that the data followed a normal distribution ($p > 0.05$). Additionally, scatter plots confirmed the linearity of relationships, and the Variance Inflation Factor (VIF) values (< 10) indicated no multicollinearity among variables.

Path analysis was conducted to examine the direct effects of parenting styles and parental psychological control on Internet addiction. The results are presented in Table 2.

Table 1. Descriptive Statistics of Variables

Variable/Subscale	Mean	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
Internet Addiction	73	0.46	0.53	0.32	0.56	0.41
Parenting Styles	86	0.23	0.36	0.14	0.42	0.34
- Permissive	35	0.15	0.36	0.14	0.42	0.34
- Authoritarian	26	0.24	0.36	0.14	0.42	0.34
- Authoritative	27	0.36	0.36	0.14	0.42	0.34
Parental Psychological Control	68	0.26	0.36	0.15	0.47	0.26
- Dependency-Oriented	32	0.42	0.36	0.15	0.47	0.26
- Achievement-Oriented	28	0.15	0.36	0.15	0.47	0.26
Media Literacy	203	0.41	0.35	0.14	0.25	0.14
- Consumption Patterns	59	0.16	0.35	0.14	0.25	0.14
- Message Characteristics	86	0.26	0.35	0.14	0.25	0.14
- Message Critique	67	0.18	0.35	0.14	0.25	0.14
Cognitive Emotion Regulation	116	0.11	0.36	0.13	0.43	0.12
- Self-Blame	6	0.01	0.36	0.13	0.43	0.12
- Self-Acceptance	4	0.02	0.36	0.13	0.43	0.12
- Rumination	7	0.01	0.36	0.13	0.43	0.12
- Positive Refocusing	3	0.01	0.36	0.13	0.43	0.12
- Planning Refocus	2	0.03	0.36	0.13	0.43	0.12
- Positive Reappraisal	4	0.05	0.36	0.13	0.43	0.12
- Putting into Perspective	3	0.06	0.36	0.13	0.43	0.12
- Catastrophizing	5	0.04	0.36	0.13	0.43	0.12
- Blaming Others	7	0.04	0.36	0.13	0.43	0.12

Table 2. Significance of Coefficients for Direct Effects

Path	Factor Loading	Standard Error	t-Value	P
Parenting Styles → Internet Addiction	0.42	0.10	3.95	0.0001
Psychological Control → Internet Addiction	0.10	0.12	0.86	0.390
Media Literacy → Internet Addiction	0.11	0.20	0.69	0.112

The findings indicate that Parenting styles have a significant and direct effect on Internet addiction ($\beta = 0.420$, $p < 0.05$). This indicates that the way parents interact with their children (e.g., authoritarian, authoritative, or permissive styles) plays an important role in shaping addictive behaviors related to Internet use. Parental psychological control and media literacy do not have a significant direct effect on Internet addiction ($\beta = 0.104$, $p > 0.05$ and $\beta = 0.117$, $p > 0.05$, respectively). This suggests that these factors do not play a significant role in directly predicting Internet addiction. These findings indicate that parenting styles have a stronger and more significant influence on Internet addiction compared to parental psychological control and media literacy. Therefore, to prevent and reduce Internet addiction, focusing on improving parenting styles and educating parents to foster healthy interactions with their children may be more effective.

The study also examined the indirect effects of parenting styles and psychological control on Internet addiction, mediated by cognitive emotion regulation and media literacy. The results are summarized below.

Parenting Styles:

- Mediated by Media Literacy: The indirect effect was small and non-significant ($\beta = 0.04$, $p > 0.05$).
- Mediated by Cognitive Emotion Regulation: The indirect effect was significant ($\beta = 0.07$, $p < 0.05$).

Psychological Control:

- Mediated by Media Literacy: The indirect effect was small and non-significant ($\beta = 0.05$, $p > 0.05$).

- Mediated by Cognitive Emotion Regulation: The indirect effect was significant ($\beta = 0.12$, $p < 0.05$).

These results highlight the critical role of cognitive emotion regulation as a mediator in the relationship between parenting practices and Internet addiction. Media literacy, however, did not significantly mediate these relationships.

Model Fit and Predictive Power

The overall model fit was evaluated using the Goodness-of-Fit (GOF) index and the coefficients of determination (R^2). The GOF index was 0.42, indicating a strong model fit. Table 3 and Figure 2 presents the R^2 values for the endogenous variables.

The R^2 values indicate that the model explains a moderate to strong proportion of the variance in the endogenous variables. Specifically, cognitive emotion regulation and media literacy collectively account for 52.7% and 46.4% of their respective variances, while the model explains 44.2% of the variance in Internet addiction.

The findings of this study provide valuable insights into the factors influencing Internet addiction among adolescents. Parenting styles have a significant direct effect on Internet addiction, while parental psychological control does not. Cognitive emotion regulation plays a crucial mediating role, whereas media literacy does not significantly mediate these relationships. The proposed model demonstrates strong predictive power and fit, offering a robust framework for understanding and addressing Internet addiction in educational and familial contexts. These results underscore the importance of fostering adaptive parenting practices and emotion regulation skills to mitigate Internet addiction among adolescents.

Table 2. Significance of Coefficients for Direct Effects

Path	Factor Loading	Standard Error	t-Value	P
Cognitive Emotion Regulation → Internet Addiction	0.23	0.11	2.09	0.037
Parenting Styles → Cognitive Emotion Regulation	0.29	0.08	3.54	0.0001
Psychological Control → Cognitive Emotion Regulation	0.52	0.07	6.82	0.0001
Parenting Styles → Media Literacy	0.33	0.07	4.21	0.0001
Psychological Control → Media Literacy	0.43	0.08	4.95	0.0001

Table 4. R^2 Values for Endogenous Variables

Variable	R Square	R Square Adjusted
Internet Addiction	0.44	0.43
Cognitive Emotion Regulation	0.52	0.52
Media Literacy	0.46	0.45

Discussion

The findings of this study contribute to the growing body of research on Internet addiction among adolescents by examining the interplay of parenting styles, parental psychological control, media literacy, and cognitive emotion regulation.

The study's findings align with and extend prior research in several ways. First, the significant direct effect of parenting styles on Internet addiction is consistent with previous studies that highlight the role of authoritative parenting in reducing problematic Internet use [25, 29]. However, the non-significant effect of parental

psychological control contradicts some studies that have found a positive association between psychological control and Internet addiction [4, 25]. This discrepancy may be due to cultural differences in the perception of psychological control or variations in measurement tools. The mediating role of cognitive emotion regulation is supported by prior research, which has shown that adaptive emotion regulation strategies can mitigate the risk of Internet addiction [19, 28]. However, the non-significant mediating role of media literacy contrasts with studies that emphasize its protective effect [43]. This suggests that media literacy may operate differently in the context of Kermanshah, where access to media education programs may be limited.

Overall, this study confirms the importance of parenting styles and cognitive emotion regulation in understanding Internet addiction while highlighting the need for further exploration of the role of media literacy and psychological control in diverse cultural contexts.

The findings have important implications for theoretical frameworks related to parenting styles, media literacy, and cognitive emotion regulation. First, the study supports Baumrind's parenting styles theory [7], demonstrating that authoritative parenting is associated with lower levels of Internet addiction. This suggests that warmth and structure in parenting are critical for fostering healthy Internet use habits.

Second, the study extends the cognitive emotion regulation framework [42] by highlighting its mediating role in the relationship between parenting practices and Internet addiction. This underscores the importance of teaching adolescents adaptive emotion regulation strategies to reduce their reliance on the Internet as an emotional escape.

Finally, the non-significant role of media literacy challenges existing assumptions about its protective effect. This finding suggests that media literacy interventions may need to be tailored to specific cultural and educational contexts to be effective. Refinements to existing models should consider the interplay between cultural factors and media literacy in shaping Internet use behaviors.

The findings offer actionable insights for various stakeholders:

For Parents:

- Adopt authoritative parenting practices that balance warmth and discipline to promote healthy Internet use.
- Avoid psychological control tactics such as guilt induction or love withdrawal, which may exacerbate emotional distress and increase the risk of Internet addiction.
- Encourage open communication about Internet use and set clear boundaries to help children develop self-regulation skills.

For Educators:

- Integrate media literacy programs into school curricula to teach students how to critically evaluate online content and manage their Internet use.

- Provide workshops on cognitive emotion regulation strategies to help students cope with stress and negative emotions without resorting to excessive Internet use.

For Policymakers:

- Develop public awareness campaigns to educate parents and adolescents about the risks of Internet addiction and the importance of balanced Internet use.
- Fund research and interventions aimed at promoting adaptive parenting practices and media literacy in underserved communities.

While this study provides valuable insights, it has several limitations that should be acknowledged. The reliance on self-reported data may introduce biases, as participants may underreport or overreport their Internet use and emotional states. The study was conducted in Kermanshah, Iran, which may limit the generalizability of the findings to other regions or cultural contexts. The study's cross-sectional design prevents causal inferences. Longitudinal studies are needed to establish causal relationships between the variables. Although standardized instruments were used, some constructs (e.g., media literacy) may require more nuanced measurement tools to capture their full complexity.

To address the limitations and build on the findings of this study, future research should consider the following directions. Conduct longitudinal studies to examine the causal relationships between parenting styles, psychological control, cognitive emotion regulation, and Internet addiction over time.

Compare the findings across different cultural contexts to explore how cultural norms and values influence the relationships between these variables. Investigate the role of other potential mediators, such as peer influence, socioeconomic status, or school climate, in shaping Internet addiction. Design and evaluate interventions that target adaptive parenting practices, media literacy, and cognitive emotion regulation to reduce Internet addiction among adolescents. Use qualitative methods to gain deeper insights into adolescents' experiences and perceptions of Internet use and addiction.

Conclusion

This study advances our understanding of the factors influencing Internet addiction among adolescents by examining the roles of parenting styles, psychological control, media literacy, and cognitive emotion regulation. The findings confirm the importance of authoritative parenting and adaptive emotion regulation while highlighting the need for further research on the role of media literacy and psychological control. The study also offers practical recommendations for parents, educators, and policymakers to address Internet addiction. By acknowledging its limitations and proposing directions for future research, this study lays the groundwork for more comprehensive and culturally sensitive approaches to mitigating Internet addiction.

Conflict of Interest

There was no conflict of interest to be declared.

Ethical Approval

The study was approved by the Ethics Committee with approval code 0000000313074925.

Declaration of Generative AI and AI-Assisted Technologies

No generative AI or AI-assisted technologies were used in the creation of this manuscript. The authors take full responsibility for the content, analysis, and originality of this publication.

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