



Are Shyness and Peer Attachment Risk or Protective Factors for Problematic Internet Use among Adolescents?

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ABSTRACT

Adolescents are in a developmental stage where relationships with peers become the primary source of emotional support, social identity, and self-regulation. When attachment to peers is not fulfilled, characterized by poor communication, lack of trust, and feeling alienated from peers, it causes adolescents with poor peer attachment to tend to be isolated from their peers. Thus, shyness, or the condition of feeling uncomfortable in interactions and being prone to restlessness, makes adolescents withdraw from their environment. These two conditions encourage adolescents to seek comfort through the online world, which can trigger excessive and maladaptive internet use, commonly known as Problematic Internet Use. This study uses a quantitative method with multiple linear regression analysis techniques. The data for this research were collected using random cluster sampling techniques with a sample size of 365 students from 2 (two) State Junior High Schools in Ponorogo, with sample age criteria of 13-15 years using a questionnaire that measures peer attachment, shyness, and problematic internet use. Based on the results of the multiple linear regression analysis, it shows that the significance values of peer attachment (X_1) and shyness (X_2) on problematic internet use (Y) are 0.000 ($p < 0.01$), meaning there is a very significant relationship between peer attachment and shyness with problematic internet use. This means that together, peer attachment and shyness can be very significant predictors of problematic internet use.

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1. INTRODUCTION

The development of information technology has significantly transformed human life, particularly through the increasingly widespread and intensive use of the internet, especially among adolescents. In Indonesia, the number of internet users has grown from 210 million in 2022 to over 221 million in 2024, with the majority comprising Generation Z-adolescents and young adults (APJII, 2024; DataReportal, 2025). Adolescents utilize the internet for various purposes, including entertainment, social media, and communication (BPS, 2025). However, uncontrolled usage raises concerns regarding its adverse effects, one of which is Problematic Internet Use (PIU) defined as compulsive internet use that disrupts social, academic, and psychological functioning (Caplan, 2010).

Problematic Internet Use among adolescents is showing an alarming upward trend. A study by Kristiana Siste et al. (2019) revealed that 31.4% of adolescents in Jakarta exhibited symptoms of PIU. This finding is corroborated by data from Menur Mental Hospital in Surabaya, which reported a surge

in mental health issues related to internet use among children and adolescents, from 892 cases in the first quarter to 2,465 in the third quarter (Kumparan, 2023). These figures indicate that PIU has become an increasingly pressing psychosocial issue warranting further investigation.

Previous research has identified both internal and external factors influencing PIU. Externally, the quality of peer attachment has been shown to correlate with tendencies toward problematic internet behavior (Reiner et al., 2017; Mukti & Bustan, 2024). Adolescents with insecure peer attachments often experience loneliness and turn to online platforms as compensation for limited real-world social interactions. Internally, shyness has been found to play a significant role in increasing the risk of PIU. Peer attachment, an external factor, has been identified as a significant predictor of PIU. Adolescents with insecure peer relationships often experience loneliness and may seek alternative forms of interaction through online platforms (Reiner et al., 2017; Mukti & Bustan, 2024). A lack of trust, poor communication, and a sense of alienation within peer groups contribute to emotional detachment and an increased preference for online social interaction. Conversely, strong peer attachment can serve as a protective factor that reduces PIU tendencies by fulfilling emotional and social needs through real-world connections (Armsden & Greenberg, 1987).

In addition to external influences, internal factors such as shyness also contribute to PIU. Shyness is defined as a psychological condition characterized by discomfort, anxiety, and inhibition in social situations (Zimbardo, 1982; Cheek & Watson, 1989). Shy individuals may avoid face-to-face interactions and instead gravitate toward online environments that feel safer and less intimidating. Previous research has shown that shyness significantly correlates with higher levels of PIU (Chak & Leung, 2004; Huan et al., 2014; Xiao et al., 2023), often mediated by feelings of loneliness. While numerous studies have examined the individual relationships between PIU and either peer attachment or shyness, research that simultaneously investigates both factors remains scarce.

Theoretically, PIU is explained through Caplan's (2010) model, which emphasizes the role of maladaptive cognitions and emotional regulation in unhealthy internet use. Peer attachment refers to the quality of emotional bonds with peers (Armsden & Greenberg, 1987), which, when weak, can lead to feelings of alienation and drive compulsive online engagement. Shyness, as defined by Zimbardo (1982), is an emotional condition characterized by anxiety and discomfort in social situations, potentially increasing an individual's reliance on online interactions.

This study aims to examine the simultaneous relationship between peer attachment and shyness with the tendency toward Problematic Internet Use among adolescents. This approach is expected to provide a more comprehensive understanding of how these two variables contribute to problematic online behaviors.

Compared to previous studies, this research provides a novel contribution by using a quantitative correlational approach with cluster random sampling in a non-metropolitan setting (Ponorogo), where similar research is still rare. The findings are expected to contribute to adolescent psychology literature and inform preventive strategies that strengthen peer relationships and reduce the negative impact of social withdrawal tendencies among adolescents. The findings of this study are expected to contribute theoretically to the field of adolescent psychology and practically serve as a foundation for preventive interventions to reduce the risk of PIU through the strengthening of social relationships and the effective management of shyness.

2. RESEARCH METHOD

This study adopted a quantitative correlational method aimed at examining the relationship between peer attachment and shyness with problematic internet use among adolescents. The correlational approach was chosen to explore the extent to which variations in the independent variables peer attachment and shyness are associated with variations in the dependent variable, namely problematic internet use (PIU).

The participants in this study were 365 adolescents aged 13 to 15 years, enrolled in two public junior high schools in Ponorogo Regency, East Java, Indonesia. Adolescents at this developmental stage are considered particularly vulnerable to digital media-related behavioral issues due to the critical

nature of their social and emotional development. To ensure that the sample accurately represented the target population, the researcher employed a random cluster sampling technique. This involved selecting entire classes from each school randomly, rather than individuals, to allow for greater efficiency and practicality in data collection within a school setting.

To measure the level of problematic internet use among adolescents, the researcher used an adapted version of the Generalized Problematic Internet Use Scale 2 (GPIUS2) developed by Caplan (2010), which was culturally adjusted to the Indonesian context by Andangsari et al. (2019). This scale consisted of 27 items that measure five core aspects: preference for online social interaction, mood regulation, cognitive preoccupation, compulsive internet use, and negative outcomes.

Prior to use, the scale was subjected to validity testing using item-total correlation analysis. The results indicated that all items showed acceptable correlation values ($r > 0.3$), suggesting that each item contributed meaningfully to the overall construct of problematic internet use. Afterward, the scale was analyzed for reliability, resulting in a Cronbach's alpha of .919, indicating excellent internal consistency.

Table 1. Reability of Problematic Internet Use Scale		
Variable	Reability Statistics	
	Cronbach's Alpha	N
Problematic Internet Use	0,956	15

Peer attachment was assessed using a modified version of the Inventory of Parent and Peer Attachment (IPPA) developed by Armsden and Greenberg (1987). For this study, the peer component was selected and refined to include 18 valid items measuring three primary dimensions of peer attachment: trust, communication, and alienation. The validity test involved calculating the item-total correlation coefficients for each item. All items demonstrated satisfactory levels of correlation, signifying that they accurately reflect the construct of peer attachment. Items that did not meet the threshold were excluded to improve the scale's psychometric quality.

Table 2. Reability of Peer Attachment Scale		
Variable	Reability Statistics	
	Cronbach's Alpha	N
Peer Attachment	0,858	18

The reliability analysis using Cronbach's alpha yielded a score of .858, indicating a high degree of internal consistency. This suggests that the scale is a stable and reliable tool for assessing the emotional bond and quality of interpersonal relationships adolescents have with their peers.

To measure shyness, the researcher adapted a scale based on the conceptual framework by Henderson and Zimbardo (1998), which conceptualizes shyness as a multidimensional construct. The scale consists of 24 valid items covering cognitive, affective, physiological, and behavioral aspects of shyness.

Table 3. Reability of Shyness Scale		
Variable	Reability Statistics	
	Cronbach's Alpha	N
Peer Attachment	0,858	18

The validity test revealed that all items met the criteria for inclusion, with item-total correlation coefficients exceeding the minimum standard, ensuring that the items collectively measured the intended construct. The reliability test resulted in a Cronbach's alpha value of .927, reflecting excellent internal consistency.

3. RESULTS AND DISCUSSIONS

This study aimed to investigate whether peer attachment and shyness simultaneously and partially predict problematic internet use (PIU) among adolescents. To test the hypothesis, a multiple

linear regression analysis was conducted using peer attachment and shyness as independent variables and PIU as the dependent variable.

Summary of Multiple Linear Regression Analysis

Table 4. Multiple Linear Regression Analysis

Variable	F	Sig.	R	R Square
Peer Attachment and Shyness with Problematic Internet Use	48.349	0,000	0,459 ^a	0,211

The regression model was statistically significant ($F = 48.476$), indicating that peer attachment and shyness together predict 21.1% of the variance in problematic internet use ($R^2 = 0.211$). This implies that the remaining 78.9% of the variance in PIU is likely influenced by other psychological, social, or contextual factors not included in this model.

Summary of Peer Attachment's Regression Analysis

Table 5. Peer Attachment Regression Analysis

Variable	β	T	Sig.	Results
Peer Attachment with Problematic Internet Use	-0,291	-7,545	0,000	Very Significant

Referring to the results of the hypothesis testing, the peer attachment variable obtained a coefficient value of $\beta = -0.291$, $t = -7.545$, with a significance level of 0.000 ($p < 0.01$), indicating a highly significant negative relationship between peer attachment and the dependent variable.

Summary of Shyness' Regression Analysis

Table 5. Shyness Regression Analysis

Variable	β	T	Sig.	Results
Shyness with Problematic Internet Use	-0,291	-7,545	0,000	Very Significant

Shyness variable yielded a coefficient of $\beta = -0.181$, $t = -4.821$, also with a significance level of 0.000 ($p < 0.01$), which indicates a highly significant negative relationship between shyness and the dependent variable. This result suggests that the higher the level of shyness, the lower the level of problematic internet use. Therefore, Hypothesis 3 is rejected.

The findings of this study confirm that both interpersonal (peer attachment) and intrapersonal (shyness) factors significantly contribute to adolescents' problematic internet use. The negative association between peer attachment and PIU supports previous studies (Reiner et al., 2017; Mukti & Bustan, 2024), which found that adolescents with insecure or weak peer relationships are more prone to use the internet excessively as a substitute for real-world social interaction. Adolescents who lack emotional closeness and trust in peer relationships may experience social alienation, leading them to prefer online interactions that feel safer and more controllable. This is in line with Caplan's (2010) theory, which highlights that individuals with deficient offline relationships often turn to the internet for mood regulation and social compensation.

In contrast, the positive association between shyness and PIU aligns with the findings of Chak and Leung (2004), Huan et al. (2014), and Xiao et al. (2023), all of which reported that shy adolescents are more likely to engage in problematic internet use. Shyness, as conceptualized by Zimbardo (1982), involves social anxiety, discomfort, and withdrawal in face-to-face interactions. This makes online environments particularly attractive for shy individuals, as digital platforms offer reduced social risks and greater control over self-presentation. Over time, this preference for online interaction can evolve into compulsive use patterns, fulfilling emotional needs at the expense of offline functioning.

Furthermore, the joint contribution of both variables ($R^2 = 0.267$) indicates that the risk of PIU is not solely determined by individual traits like shyness or external relational quality such as peer

attachment, but rather by the interplay between these psychological and social dimensions. This finding supports a multi-dimensional approach to understanding PIU, reinforcing the need for preventive interventions that address both personal and relational factors in adolescent development.

4. CONCLUSION

This study aimed to examine the relationship between peer attachment and shyness with problematic internet use (PIU) among adolescents. Based on the results of multiple linear regression analysis, it can be concluded that peer attachment and shyness together significantly predict PIU, although the overall contribution of both variables is relatively low, accounting for only 21.1% of the variance. This indicates that PIU in adolescents is a complex behavior likely influenced by many other factors beyond the scope of this study. Individually, peer attachment was found to have a negative and highly significant effect on PIU, suggesting that adolescents with lower quality peer relationships are more likely to engage in problematic internet behaviors. Interestingly, shyness also showed a significant negative effect on PIU, which is contrary to most previous findings. This implies that in this particular sample, adolescents with higher levels of shyness tend to exhibit lower levels of problematic internet use, leading to the rejection of the third hypothesis. These findings highlight the importance of considering both interpersonal (peer attachment) and intrapersonal (shyness) variables when understanding adolescents' internet use behavior. However, the relatively small effect size also emphasizes the need for future studies to explore additional factors such as family dynamics, emotional regulation, and school environment to obtain a more comprehensive understanding of PIU in adolescence.

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