

RESEARCH ARTICLE

The relationship between social exclusion and internet addiction among Chinese secondary vocational school students: The mediating role of resilience

Ruichen Jiang^{1,2,3*}, Fei Xie⁴¹School of Education Science, Anqing Normal University, Anqing, Anhui, China²Student Affairs Office, Anqing Normal University, Anqing, Anhui, China³Institute of Educational Neuroscience, Anqing Normal University, Anqing, Anhui, China⁴School of Foreign Languages, Anqing Normal University, Anqing, Anhui, China

Abstract

Background: Social exclusion is a common experience among adolescents, particularly in vocational education settings, and has been linked to various behavioral problems. However, the mechanisms underlying the relationship between social exclusion and internet addiction remain underexplored.

Objective: This study investigates the impact of social exclusion on internet addiction among Chinese secondary vocational school students and examines the mediating role of resilience in this relationship.

Methods: A total of 1,128 Chinese secondary vocational school students were surveyed using the Social Exclusion Scale, the Resilience Scale for Adolescents, and the Internet Addiction Test.

Results: Social exclusion was significantly negatively correlated with resilience ($r = -0.608, p < 0.001$) and significantly positively correlated with internet addiction ($r = 0.468, p < 0.001$). Resilience was significantly negatively correlated with internet addiction ($r = -0.640, p < 0.001$). Resilience partially mediated the relationship between social exclusion and internet addiction (indirect effect = 0.547, accounting for 72.4% of the total effect).

Conclusion: Social exclusion increases the risk of internet addiction by eroding psychological resilience.

Keywords: Secondary vocational school students; Social exclusion; Internet addiction; Resilience; Mediation

***Corresponding author:**Ruichen Jiang
(JiangRC@aqnu.edu.cn)

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1. Introduction

In recent years, the widespread use of mobile internet technology has made adolescents among the most active internet users. Reports from the China Internet Network Information Center indicate a steady increase in the number of adolescent users.¹ Within this population, secondary vocational school (SVS) students represent a distinctive group. Many of these students enter vocational education after performing below expectations on high school entrance examinations, and they often encounter a

combination of peer relationship issues,² social discrimination,³ and low self-identity.⁴ In this context, online environments may serve as an accessible space for social interaction and self-expression, but may also be associated with patterns of excessive use.^{5,6}

Problematic patterns of internet use, often referred to as internet addiction, have been widely discussed due to their associations with a range of negative outcomes among adolescents.^{6,7} Although the terminology remains debated, the present study adopts the term “internet addiction,” consistent with the operational definition reflected in the Internet Addiction Test.⁸ It refers to excessive and poorly regulated internet use associated with functional impairments. In practical terms, such patterns may manifest as difficulties disengaging from online activities,⁹ excessive use of short-form video platforms or online games,⁴ and reduced engagement in face-to-face social interactions.⁵ Prior research has connected such patterns with difficulties in emotional regulation, social functioning, psychological well-being, and even altered neural functioning.¹⁰⁻¹² In vocational school settings, internet use is often closely integrated into daily routines, including entertainment, social interaction, and even classroom-related activities, which may further increase exposure to prolonged online engagement. SVS students, who may face multiple stressors in offline contexts, rely more heavily on online games and other internet activities to escape real-life pressures, find emotional satisfaction, and shape their self-identity.⁴

Interpersonal experiences have been consistently identified as relevant to adolescents’ internet use behaviors. In particular, social exclusion—defined as experiences of rejection or neglect that threaten one’s sense of belonging—has received growing attention.^{9,13} Empirical studies suggest that such experiences are associated with changes in emotional and cognitive functioning, as well as increased risk of psychological difficulties.¹⁴⁻¹⁶ Some evidence further indicates that adolescents who experience exclusion may turn to online environments as an alternative space for interaction or emotional relief, which may, over time, be linked to more persistent forms of problematic use.^{9,17,18}

Despite these findings, the processes through which social exclusion is associated with internet addiction remain insufficiently examined, particularly among SVS students. Much of the existing work has focused on contextual or structural factors, whereas less attention has been given to individual psychological resources that may shape these associations. One such factor is resilience, commonly understood as the capacity to adapt to stress and adversity.¹⁹⁻²¹ Resilience involves multiple components, including emotional regulation, problem-solving, and

adaptive coping, and has been linked to more favorable psychological adjustment.^{22,23} Individuals with higher resilience may be better equipped to manage interpersonal stress, whereas lower resilience has been associated with avoidance-oriented coping and greater reliance on alternative forms of regulation.^{20,24}

It is also important to consider that social exclusion in adolescents may arise from different sources, such as peer-related difficulties (e.g., rejection or bullying), academic setbacks, or limited support in family contexts. These experiences may place varying demands on individuals’ coping capacities and adjustment processes.²⁵ In addition, resilience is often viewed as a multidimensional construct, including emotional, social, and behavioral components.²² For instance, emotional resilience may involve regulating negative affect, whereas social resilience may relate to maintaining interpersonal connections under stress. Acknowledging these distinctions may help further contextualize the relationship between social exclusion and internet use in this population. In this context, resilience may be related to adolescents’ responses to social exclusion and their patterns of internet use.²⁰ It is possible that social exclusion is associated with lower levels of resilience, which in turn may relate to greater engagement in internet-based coping behaviors and higher levels of problematic use.¹⁷ Examining this pattern may help clarify how interpersonal experiences and psychological resources are linked within this population.

Although prior studies have identified social exclusion as a relevant factor in adolescent internet use,^{9,17} research focusing specifically on SVS students remains limited. This group often occupies a relatively disadvantaged position within the educational system and may experience cumulative social and academic pressures.⁴ At the same time, empirical work examining how environmental stressors and psychological resources are jointly associated with internet use behaviors is still relatively scarce.^{5,22}

Against this background, the present study examines the associations among social exclusion, resilience, and internet addiction in SVS students. Specifically, it investigates (i) the association between social exclusion and internet addiction, and (ii) whether resilience is involved in this relationship in a manner consistent with a mediating role. The study proposes the following hypotheses: (i) H1: Social exclusion is positively associated with internet addiction among SVS students; (ii) H2: Social exclusion is negatively associated with resilience; and (iii) H3: Resilience is related to the association between social exclusion and internet addiction in a manner consistent with a mediating role.

2. Methods

2.1. Participants

Using a stratified cluster sampling approach, data were collected from four SVSs located in Anhui and Jiangsu provinces between September and December 2024. The participating schools were selected based on their accessibility and willingness to cooperate with the research. Within each school, intact classes were randomly chosen as sampling units to ensure coverage across different grades.

Before data collection began, informed consent was obtained from each participant and their guardians. A total of 1,203 questionnaires were initially collected. Questionnaires were excluded if they met any of the following criteria: (i) more than 20% of items were unanswered, (ii) respondents selected the same option consecutively for more than 80% of items (i.e., straight-lining), or (iii) logically inconsistent responses were identified (e.g., contradictory answers to reverse-coded items). After applying these exclusion criteria, 1,128 valid questionnaires were retained for analysis (retention rate: 93.8%). Given the low proportion of missing data (<5% per variable), listwise deletion was applied for subsequent analyses.

The final sample consisted of 570 males (50.5%) and 558 females (49.5%), including 394 first-year students (34.9%), 353 second-year students (31.3%), and 381 third-year students (33.8%). Participants ranged in age from 14 to 19 years (mean = 16.7, standard deviation = 1.1).

2.2. Measures

All instruments used in this study have been previously validated in Chinese adolescent populations, with established factor structures and satisfactory construct validity reported in prior research.

2.2.1. Revised Social Exclusion Scale

The Ostracism Experience Scale for Adolescents has a Chinese version revised by Zhang *et al.*²⁶ based on the original scale developed by Gilman *et al.*²⁷ This version was adopted in the present study. The scale includes 11 items across two dimensions: ignorance (5 items) and rejection (6 items, reverse-scored). Items are rated on a 5-point Likert scale (1 = “Never” to 5 = “Always”), with higher total scores indicating greater social exclusion. The scale has demonstrated good reliability and validity in adolescent populations.^{28,29} In this study, Cronbach’s α was 0.84 for ignorance, 0.81 for rejection, and 0.79 for the total scale. All items showed acceptable item–total correlations ($r > 0.30$), indicating good internal consistency at the item level.

2.2.2. Resilience scale for adolescents

The Adolescent Resilience Scale, developed by Hu and Gan,³⁰ was used. This 27-item scale, based on ecological systems theory, includes five sub-dimensions: goal focus, emotional control, positive cognition, family support, and interpersonal assistance. A 5-point Likert scale ranging from 1 (completely out of line) to 5 (fully compliant) was used, with higher total scores indicating stronger resilience. The original validation showed a total Cronbach’s α of 0.85, subscale reliability between 0.79 and 0.91, and convergent validity with the Connor–Davidson Resilience Scale ($r = 0.71$). In this study, the total α was 0.90, and subscale α values ranged from 0.83 to 0.89. All items showed acceptable item–total correlations ($r > 0.30$), indicating good internal consistency at the item level.

2.2.3. Internet Addiction Test

The Chinese version of the Internet Addiction Test (IAT), compiled by Young³¹ and revised by Lai *et al.*³², was used. The scale originates from the Diagnostic and Statistical Manual of Mental Disorders IV definition of pathological gambling. It includes 20 questions, each answered on a 1-to-5 scale (1 = “Never” to 5 = “Always”). Scores are interpreted as follows: 20–49 (normal use), 50–60 (addictive tendencies), 61–79 (moderate addiction), and 80–100 (severe addiction). The Chinese IAT has shown good reliability and validity among adolescents.⁷ In this study, Cronbach’s α was 0.91, and higher IAT scores were interpreted as indicating greater levels of internet addiction, operationalized as excessive and poorly controlled internet use associated with functional impairment. All items showed acceptable item–total correlations ($r > 0.30$), indicating good internal consistency at the item level.

Overall, the instruments demonstrated satisfactory internal consistency in the current sample, and their previously established factor structures provide support for their construct validity. The use of total scores is consistent with the original scale design and prior empirical applications.

2.3. Procedure

The data were collected using a cross-sectional survey design. Prior to administration, trained researchers provided standardized instructions to students in classroom settings and emphasized that participation was voluntary and that confidentiality would be maintained. The questionnaires were completed during regular class periods in a group format and required approximately 15 min to finish.

To reduce potential response bias, participants were assured of anonymity and instructed to respond honestly

based on their actual experiences. All questionnaires were completed on site and returned immediately. In addition to the main study variables, basic demographic information (e.g., gender and grade level) was also collected for subsequent analysis. Given that participants were nested within schools, potential clustering effects were considered. However, due to the limited number of schools, multilevel modeling was not applied.

2.4. Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences software (version 26.0). Measurement data are presented as mean $\pm$ standard deviation, and count data as number (percentage). We assessed common method bias with Harman's single-factor test. Pearson correlation was computed, and mediation effects were examined using the PROCESS v3.5 plugin with 5,000 bootstrap resamples. A p -value < 0.05 was considered statistically significant.

2.5. Quality control

All researchers received uniform training and used standardized instructions. All questionnaires were examined for completeness on the spot, as soon as they were collected, and invalid responses (e.g., patterned answers) were excluded. Data were double-entered for accuracy. The study was approved by the university ethics committee (Approval No. AQNU2023096) and complied with the Declaration of Helsinki.

3. Results

3.1. Common method bias test

According to Harman's single-factor test, the first factor accounted for 29.8% of the variance, which is below the 40% threshold. This suggests that common method bias was not significant.

3.2. Descriptive statistics and the correlation analysis

Table 1 presents the descriptive statistics of the study variables, including means (M), standard deviations (SD), and correlations. One striking result is the significant intercorrelation among all primary variables. Specifically, social exclusion was negatively correlated with resilience ($r = -0.608$, $p < 0.001$), and resilience was negatively correlated with internet addiction ($r = -0.640$, $p < 0.001$). Additionally, social exclusion was positively correlated with internet addiction ($r = 0.468$, $p < 0.001$). These outcomes satisfied the necessary conditions for mediation analysis. Moreover, because each correlation coefficient was below 0.7, potential multicollinearity had been effectively avoided.

3.3. Mediation effect test

Mediation analysis was conducted using PROCESS Model 4. Unstandardized coefficients (B), standard errors (SE), and 95% confidence intervals (CI) are reported. The indirect effect was tested using bootstrapping with 5,000 resamples, controlling for gender and grade. The results showed that social exclusion was negatively associated with resilience ($B = -0.992$, $SE = 0.040$, $t = -24.682$, $p < 0.001$). In turn, resilience was negatively associated with internet addiction ($B = -0.551$, $SE = 0.028$, $t = -19.495$, $p < 0.001$). The total effect of social exclusion on internet addiction was significant ($B = 0.756$, $SE = 0.044$, $p < 0.001$). When resilience was included in the model, the direct effect remained significant but was reduced in magnitude ($B = 0.209$, $SE = 0.047$, $p < 0.001$). The indirect effect of social exclusion on internet addiction through resilience was statistically significant ($B = 0.547$, 95% CI : [0.470, 0.627]), consistent with a partial mediating role of resilience. Detailed results are presented in Table 2 and Figure 1. These findings provide support for the proposed hypotheses.

In terms of effect size, the indirect effect accounted for a substantial proportion of the total effect, whereas the direct effect remained relatively smaller. This pattern suggests that resilience was more strongly associated with the relationship between social exclusion and internet addiction than the direct association alone. From an applied perspective, these findings suggest that psychological factors, such as resilience, may be relevant to understanding how adolescents respond to social exclusion in vocational school settings, although further research is needed to clarify their practical implications.

4. Discussion

This study focused on SVS students and examined the associations among social exclusion, resilience, and internet addiction, with particular attention to the potential role of resilience. This focus on SVS students is particularly important, as their unique educational and social contexts may amplify the psychological impact of social exclusion compared to other adolescent populations. SVS students face significant challenges in career development and social integration.⁴ While prior research has frequently examined antecedent variables of internet addiction—such as individual traits, family functioning, or school-related factors—or its direct physical and psychological consequences,^{2,33} the present study innovatively shifts attention to social exclusion as a critical environmental factor. By incorporating resilience as a key psychological factor, the results highlight a pattern in which social exclusion, resilience, and internet

Table 1. Descriptive statistics and correlations among variables ($n = 1,128$)

Variable	Mean	SD	OES-A	RSA	IAT
OES-A	33.51	8.75	-	-	-
RSA	77.67	14.87	-0.608***	-	-
IAT	54.79	14.45	0.468***	-0.640***	-

Note: *** $p < 0.001$.

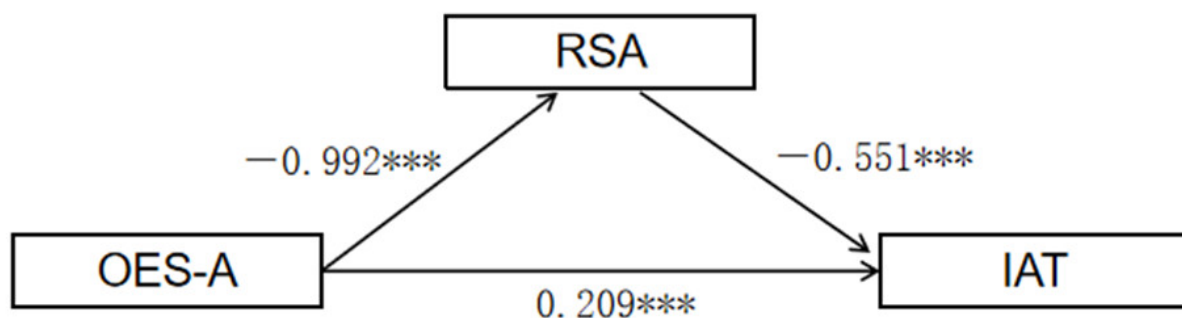
Abbreviations: IAT: Internet Addiction Test; OES-A: Ostracism Experience Scale for Adolescents; RSA: Resilience Scale for Adolescents.

Table 2. Mediation analysis results

Effect	B	SE	β	t	p	95% CI
Path a (OES-A $\rightarrow$ RSA)	-0.992	0.0402	-0.584	-24.682	<0.001	[-1.0713, -0.9136]
Path b (RSA $\rightarrow$ IAT)	-0.551	0.0283	-0.5668	-19.495	<0.001	[-0.6064, -0.4955]
Total effect (c)	0.756	0.0441	0.4574	17.15	<0.001	[0.6692, 0.8421]
Direct effect (c')	0.209	0.0473	0.1264	4.413	<0.001	[0.1160, 0.3016]
Indirect effect (a $\times$ b)	0.547	0.0395	—	—	<0.001	[0.4702, 0.6268]

Note. Unstandardized coefficients (B) are reported. Bootstrap confidence intervals are based on 5,000 resamples.

Abbreviations: CI: Confidence interval; IAT: Internet Addiction Test; OES-A: Ostracism Experience Scale for Adolescents; RSA: Resilience Scale for Adolescents; SE: Standard error.

**Figure 1.** Standardized path coefficients for the mediation model between social exclusion and internet addiction. *** $p < 0.001$.

Abbreviations: IAT: Internet Addiction Test; OES-A: Ostracism Experience Scale for Adolescents; RSA: Resilience Scale for Adolescents.

addiction are systematically associated, consistent with a model in which lower resilience may be linked to higher levels of internet addiction. This approach enriches our understanding of the interplay between environmental and psychological factors in the development of internet addiction and adds depth to existing empirical findings.

The empirical analysis confirms the key relationships between the primary variables: social exclusion was positively correlated with internet addiction and negatively correlated with resilience, while resilience was itself negatively correlated with internet addiction. These results confirm hypotheses H1 and H2 and are consistent with existing literature, indicating that adverse interpersonal environments constitute significant risk factors for adolescent internet addiction.³⁴ Moreover, resilience serves as a crucial protective resource that can effectively buffer the negative impact of adversity on maladaptive behavioral outcomes such as internet addiction.²²

The central finding of this study is that resilience played a partial mediating role between social exclusion and internet addiction, thereby confirming hypothesis H3. This suggests that the association between social exclusion and internet addiction may be partly explained by differences in resilience. Specifically, social exclusion may deplete individuals' resilience resources, which in turn increases the risk of internet addiction. This result provides further support for both the stress-coping theory²⁵ and resilience theory.²²

First, social exclusion, characterized by tense, conflictual, or alienating interactions, constitutes a persistent stressor and adverse experience for SVS students. This form of stress erodes core components of resilience, including the capacity for emotional regulation (making it more difficult to manage feelings of anxiety, loneliness, etc.), the maintenance of positive cognition and optimistic beliefs (predisposing individuals to negative interpersonal attributions), and the ability to engage in constructive problem-solving and sustain effort in the face of challenges (increasing the tendency to avoid rather than resolve interpersonal conflicts).^{24,35} Second, when resilience is substantially diminished due to chronic stress, the individual's reservoir of effective coping resources becomes depleted. Under these conditions, the online world—with its attributes of anonymity, controllability, instant gratification, and diverse alternative experiences (social, gaming, entertainment)—becomes a highly attractive “refuge” for escaping real-world interpersonal pain.^{34,36,37} When the internet is used as a coping strategy (i.e., compensatory internet use), it may be linked to more persistent patterns of use over time, which in turn could

be associated with a higher risk of internet addiction and, over time, reinforce an avoidance-oriented style of stress coping.³⁸ These findings may reflect a process in which adverse social environments are associated with lower levels of psychological resources (e.g., resilience), which may in turn be linked to greater reliance on the internet and an elevated risk of internet addiction.

In terms of theoretical contribution, this study offers several implications. First, it highlights a pattern of associations among social exclusion, resilience, and internet addiction, suggesting that resilience may be related to the association between social exclusion and internet addiction. In this way, the findings contribute to a more nuanced understanding of how environmental and psychological factors are jointly associated with internet addiction. Second, the results underscore the pivotal role of resilience as a nexus connecting environmental stress (interpersonal distress) and maladaptive behavior (internet addiction), offering empirical support from a resilience perspective for understanding the etiology of internet addiction among adolescents, particularly SVS students.^{19,22} Finally, by focusing on the frequently overlooked SVS student population—who face distinctive developmental challenges and specific interpersonal environments—this study provides a mechanistic explanation for their particular vulnerabilities, thereby enriching the literature in this field.³⁵

Based on these findings, several practical implications may be considered. First, fostering more inclusive school environments may help reduce experiences of social exclusion. SVSs could consider promoting peer connection through structured group activities, peer support systems, and programs that encourage respectful interaction and empathy. Similar approaches have been discussed in prior research on school climate and adolescent adjustment, suggesting their potential relevance across educational contexts. Second, resilience-oriented support may represent another relevant direction. Schools could incorporate elements of resilience development into mental health education, such as emotion regulation, problem-solving, and interpersonal skills training. These approaches are broadly consistent with existing resilience-focused programs that aim to strengthen coping capacities and psychological adjustment.²⁴ Third, early identification of students who experience higher levels of social exclusion or lower resilience may be beneficial. Providing timely psychological support, such as counseling or group-based interventions, may help students develop more adaptive coping strategies when facing interpersonal stress. Although the present study does not directly evaluate intervention outcomes, these suggestions are consistent with the observed pattern of associations.

Several limitations should be considered. First, because the study employed a cross-sectional approach, causal direction and changes over time could not be determined; for example, higher levels of internet addiction may be associated with reduced resilience or increased social exclusion. One way to determine temporal precedence and test strategies to strengthen resilience is to conduct longitudinal studies or randomized controlled trials in future research. Second, although resilience was examined as a key factor, other individual (e.g., loneliness, depressive symptoms) and contextual influences (e.g., family and peer environments) may also be relevant. Third, the sample was drawn from SVS students in Anhui and Jiangsu provinces, which may limit generalizability to other regions and educational contexts. In addition, all variables were self-reported, so common method bias cannot be entirely ruled out. Finally, because students were nested within schools, some degree of clustering may exist, although its impact is likely to be modest.

5. Conclusion

This study examined the relationships among social exclusion, resilience, and internet addiction in SVS students. The findings showed that higher levels of social exclusion were associated with lower resilience and greater internet addiction, while resilience was inversely related to internet addiction. The results also indicated a pattern in which resilience was involved in the association between social exclusion and internet addiction in a partial mediating role. Overall, these findings provide an empirical description of how these factors co-occur within this group and offer a basis for further investigation.

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Conflict of interest

The authors declared no conflict of interest regarding the publication of this paper.

Author contributions

Conceptualization: Ruichen Jiang

Formal analysis: Ruichen Jiang

Investigation: Ruichen Jiang

Methodology: Ruichen Jiang

Writing—original draft: All authors

Writing—review & editing: Ruichen Jiang

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Academic Committee of Anqing Normal University (approval code/No. AQNU2023096). All subjects involved in this study provided written informed consent to participate.

Consent for publication

All subjects involved in this study provided written informed consent for their anonymized data to be used for publication.

Availability of data

Due to data privacy regulations, individual participant data collected in this study will not be publicly accessible. The data presented in this study are available on request from the corresponding author.

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