Journal of Psychology in Africa, 2026
Vol. 36, No. 2, 285–291, http://doi.org/10.32604/jpa.2026.074079

Relationship between parental psychological control and problematic gaming among Chinese adolescents: A chain mediation model

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Received: 01 October 2025; Accepted: 03 March 2026; Published: 29 April 2026

Abstract: This study explored the relationship between parental psychological control (PPC) and adolescents' problematic gaming (PG) focusing on the mediating roles of self-control (SC) and deviant peer affiliation (DPA). A total of 2028 adolescents from high schools completed self-report measures on PPC, SC, DPA, and PG. The results revealed that PPC positively predicted PG. SC mediated the relationship between PPC and PG, and also revealed that DPA also played a mediating role in this association. Additionally, SC and DPA operated in a chain mediation, where PPC reduced SC, which in turn increased the likelihood of DPA, ultimately contributing to PG. The findings provide theoretical insights by integrating Ecological Systems Theory and Choice Theory, and practical implications for interventions focusing on enhancing SC and reducing DPA to mitigate adolescents' PG.

Keywords: Parental psychological control; self-control; deviant peer affiliation; problematic gaming

Introduction

As internet access and digital media have become ubiquitous in China, online activity now occupies a central place in adolescents' everyday lives. The 2022 National Report on Internet Use Among Minors indicates that 96.8% of Chinese minors are online, and roughly one in five shows signs of internet dependence or addiction (China Internet Network Information Center (CNNIC), 2023). In addition, China has maintained strict regulatory limits on minors' online gaming time. More recently, regulators have promoted the construction of "minor modes" across mobile terminals/apps/platforms to support parental management and to limit minors' usage duration. Against this backdrop, a focused look at specific behavioral addictions is warranted. Problematic gaming (PG), conceptualized in line with DSM-5 Internet Gaming Disorder criteria as persistent, recurrent gaming that causes clinically meaningful impairment, has drawn particular concern. Recent meta-analyses estimate a global PG prevalence of about 3–3.3% (e.g., Stevens et al., 2021; Kim et al., 2022), and accumulating evidence links PG to a spectrum of adverse outcomes, including poorer academic attainment, heightened aggression, social withdrawal, and elevated internalizing symptoms such as anxiety and depression (Düll et al., 2024). Therefore, understanding the factors that influence adolescents' PG and the mechanisms underlying such behaviors is of significant practical importance. This study aims to explore the influence of parental psychological control (PPC) on adolescents' PG and the mechanisms involved, based on the frameworks of ecological systems theory (Bronfenbrenner, 1986) and choice theory (Glasser, 1999). Specifically, this study will examine the serial mediating roles of self-control (SC) and deviant peer affiliation (DPA) in this relationship, providing scientific insights and strategies for guiding the behavioral development of adolescents.

The relationship between PPC and PG

Ecological Systems Theory, proposed by Bronfenbrenner (1986), posits that the family serves as the most influential microsystem impacting individual development. PPC, as a significant family factor, has been closely linked to adolescents' behavioral development (Scharf & Goldner, 2018). PPC refers to the attempts by parents to control their adolescents' emotions, thoughts, perspectives, and parent-child relationships. This is achieved through strategies such as inducing guilt, withdrawing love, and exerting authority to regulate and supervise the emotional, cognitive, and behavioral development of their children (Barber, 1996). In the Chinese cultural context, parenting is often embedded in collectivistic values and a strong emphasis on family interdependence and obedience, which may make psychologically controlling practices (e.g., guilt induction, love withdrawal, authority assertion) relatively salient in parent-adolescent interactions. According to Glasser's Choice Theory, PPC undermines adolescents' need for autonomy (Glasser, 1999). When adolescents perceive that fulfilling their autonomy needs is more important than maintaining a positive relationship with their parents, they are likely to choose not to comply with parental guidance and may engage in behaviors that help satisfy their needs. Research has shown that in Chinese adolescent populations, particularly among middle and high school students, PPC positively predicts PG (Ji et al., 2024; Wang et al., 2022). Meta-analyses further indicate that PPC consistently predicts adolescents' PG both cross-sectionally and longitudinally (Nielsen et al., 2020; Lin et al., 2020). However, several important limitations remain in the existing literature. First, most prior studies have focused primarily on the direct association between PPC and PG, paying insufficient attention to the underlying psychological and social mechanisms that may explain this relationship. Second, existing research has

typically examined family influences in isolation, with limited consideration of how individual characteristics and peer contexts jointly shape adolescents' gaming behaviors. Third, much of the available evidence has relied on single-mediator models, which may oversimplify the complex developmental processes through which PPC exerts its influence. Consequently, there is a need for more integrative research that simultaneously considers multiple systems and mechanisms. Grounded in Ecological Systems Theory, the present study seeks to address these gaps by examining how PPC relates to adolescents' PG through both individual (SC) and peer-level (DPA) pathways. By testing a comprehensive mediation model, this study aims to provide a more nuanced understanding of the processes linking family dynamics to PG among Chinese adolescents.

The mediating role of SC

SC is defined as an individual' s capacity to independently manage their behavior in alignment with personal or societal standards and to plan for the future (Baumeister et al., 2007). According to SC theory (Hay, 2001), parental upbringing can influence an individual's SC abilities, which in turn affects their behavioral development. Since psychological control is inherently intrusive, excessive psychological control by parents can undermine adolescents' sense of autonomy and competence, leading to emotional distres, which negatively impacts the development of SC (Bai et al., 2020; Li et al., 2013). Previous research with adolescents found a significant negative correlation between PPC and SC (Bai et al., 2020; Zhang et al., 2024). Furthermore, an individual' s level of SC plays a crucial role in shaping their behavior. Adolescents with higher SC are better able to evaluate the potential consequences of their actions and understand the appropriate behaviors in various social contexts, thus exhibiting fewer addictive behaviors (Hu et al., 2025). A longitudinal study by Cudo et al. (2023) indicated that SC can significantly negatively predict PG. Although numerous studies have documented the separate links between PPC and SC, and between SC and PG, relatively few studies have integrated these variables within a single explanatory model. Consequently, the potential mediating role of SC in the relationship between PPC and PG has not been sufficiently examined.

The mediating role of DPA

During adolescence, peer influences often overshadow parental influences in shaping behavior (Albert & Steinberg, 2011), making DPA, defined as involvement with peers who deviate from societal norms (Chen et al., 2015), a critical developmental factor. The Choice Theory (Glasser, 1999) provides a framework for understanding the PPC-DPA link. When parents exert psychological control to restrict adolescents' peer choices, this constraint may inadvertently increase the allure of deviant peers. Empirical findings support this notion, revealing a positive association between PPC and DPA (Tian et al., 2019; Lin et al., 2020, 2022). In turn, Social Group Theory (Harris, 1995) and Peer Pressure Theory (Chadee et al., 2019) explain how affiliation with deviant peers shapes individual behavior. To achieve group integration, adolescents tend to adopt the attitudes and behaviors prevalent in their peer context, potentially leading to externalizing problems such as PG (Chadee et al., 2019). The robust association between DPA and PG has been consistently documented in both cross-sectional and longitudinal research (Lin et al., 2020; Li et al., 2022). Although the direct link between DPA and PG is well established, the familial precursors of DPA, particularly the role of PPC, have received limited empirical attention. This gap underscores the need to examine whether DPA serves as a mechanism linking PPC to adolescent PG.

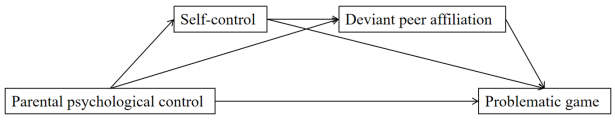

Figure 1. The hypothesized chain mediation model

The chain mediating role of SC and DPA

According to buffering hypothesis, positive individual attributes can attenuate the adverse effects of external risk factors on adjustment (Ellis et al., 2017). In this vein, higher SC reduces youths' susceptibility to detrimental social contexts: it mitigates the impact of negative family processes (e.g., PPC) and adverse interpersonal experiences such as peer deviance on problem behaviors (Li et al., 2015). Accordingly, adolescents with greater SC are less prone to affiliating with deviant peer groups. However, low SC disposes individuals to seek out antisocial peers and, in turn, to engage in rule-breaking (Gottfredson & Hirschi, 1990). Empirical studies consistently show that adolescents with poorer SC are attracted to groups that endorse hedonistic, effort-averse values and lifestyles, display reduced regard for conventional norms, and are more likely to identify with and join deviance-prone peers (Holt et al., 2012; Liu et al., 2020; Wang et al., 2023). Despite these insights, existing research has rarely examined these processes within an integrated developmental pathway. Most prior studies have investigated either the mediating role of SC or the influence of DPA separately, without considering how deficits in SC may increase adolescents' vulnerability to deviant peer environments. Consequently, the potential sequential mechanism, from PPC to reduced SC, to increased DPA, and ultimately to PG remains largely unexplored.

The current study

Grounded in Ecological Systems Theory and Choice Theory, the present study proposes a chain mediation model (Figure 1) to clarify how PPC relates to adolescents' PG through two developmentally salient pathways: SC and DPA. By jointly considering the family, individual, and peer contexts, the model aims to delineate the integrated relations among these systems and to illuminate mechanisms underlying the emergence of PG in adolescence. Accordingly, we test three hypotheses:

H1. PPC is positively associated with adolescents' PG.

H2. SC mediates the association between PPC and adolescents' PG.

H3. DPA mediates the association between PPC and adolescents' PG.

H4. SC and DPA act as a chain mediator linking PPC to adolescents' PG.

Methods

Participants and procedures

A total of 2028 adolescents from three schools in Henan Province, China, participated in this study. Their ages ranged from 13 to 18 years (M = 16.15, SD = 1.646), with 1154 males and 874 females comprising the sample. Participants were recruited using a cluster sampling method and completed paper-based questionnaires during school hours. Both student assent and parental consent were obtained after clarifying the voluntary nature of the study and the confidentiality of responses. All research procedures followed were in accordance with the ethical standards of the World Medical Association (Declaration of Helsinki) for experiments involving human subjects. All conducted procedures received approval from the ethical committee of the Academic Ethics and Moral Committee of Xinxiang Vocational and Technical College (Decision No. 045 of 2025). The research protocol was approved by the authors' institutional review board. Small incentives were provided upon completion, contributing to a high response rate of 92.2% (2028 valid responses from 2200 distributed questionnaires).

Measures

PPC

PPC was assessed using the 18-items PPC subscale from the Chinese version of the Parental Control Questionnaire (Wang et al., 2007). Participants answered the item on a five-point scale (1 = strongly disagree, 5 = strongly agree), where higher scores reflect stronger perceptions of PPC. In the current sample, the Cronbach's α coefficient for the scale was 0.96.

PG

PG was measured using the DSM-5 Internet Gaming Disorder Scale, developed by Pontes and Griffiths (2015). The scale consists of 9 items, each rated on a 5-point Likert scale ranging from 1 (never) to 5 (very often). In the current sample, the Cronbach's α coefficient for the scale was 0.85.

DPA

DPA was assessed using the DPA Scale developed by Li et al. (2016), (2013). The scale consists of 8 items. Participants answered the item on a five-point scale (1 = none, 5 = all of them), where higher scores reflect greater affiliation with deviant peers. In the current sample, the Cronbach's α coefficient for the scale was 0.79.

SC

SC was measured using the 21-item Chinese version of the revised SC Dual-System Scale (DMSC-S) (Xie et al., 2014). Participants answered the item on a five-point scale (1 = strongly disagree, 5 = strongly agree), where higher scores indicate better SC. In the current sample, the Cronbach's α coefficient for the scale was 0.86.

Statistical analyses

Data were analyzed using SPSS (Version 27.0) in conjunction with the PROCESS macro (Hayes, 2013). Preliminary data screening revealed a minimal proportion of missing values (<2% across all variables). In line with methodological recommendations (Schafer, 1999; Bennett, 2001), listwise deletion was applied, as missing data below 5% is unlikely to introduce substantial bias or reduce statistical power. To assess the potential influence of common method bias, Harman's single-factor test was initially conducted. Next, descriptive statistics and Pearson correlation analyses were performed to examine the means, standard deviations, and bivariate relationships among all study variables. The hypothesized mediation model was tested using PROCESS Model 6. For inference, 5000 bias-corrected bootstrap samples were used to generate confidence intervals for the indirect effects. Based on prior evidence indicating significant associations between demographic characteristics and PG (André et al., 2020), participants' gender and age were included as control variables.

Results

Common method bias

To examine the potential influence of common method bias, we applied Harman's single-factor test (Podsakoff et al., 2003) to all self-reported items. The unrotated factor solution extracted nine factors with eigenvalues > 1. The first factor accounted for only 22.93% of the total variance, falling below the 40% threshold. Thus, common method bias is not a serious concern in the present investigation.

Preliminary analyses

As displayed in Table 1, the correlation analysis revealed several significant associations among the variables. Firstly, a negative correlation emerged between PPC and SC ($r = -0.195$, $p < 0.001$). Furthermore, SC was found to be inversely related to both DPA ($r = -0.281$, $p < 0.001$) and PG ($r = -0.337$, $p < 0.001$). In contrast, a positive relationship was observed between DPA and PG ($r = 0.447$, $p < 0.001$).

The chain mediation model

Table 2 shows the three equations applied to evaluate the chain mediation model. In Eq. (1), PPC predicted SC ($\beta = -0.19$, $t = -8.66$, $p < 0.001$). Eq. (2) demonstrated that PPC predicted DPA ($\beta = 0.15$, $t = 6.86$, $p < 0.001$), and SC had a negative effect on DPA ($\beta = -0.26$, $t = -12.06$, $p < 0.001$). Additionally, gender negatively predicted DPA ($\beta = -0.26$, $t = -6.20$, $p < 0.001$). In Eq. (3), PPC predicted PG ($\beta = 0.18$, $t = 9.17$, $p < 0.001$), while SC had a negative effect ($\beta = -0.21$, $t = -10.28$, $p < 0.001$). DPA was a positive predictor of PG ($\beta = 0.34$, $t = 16.95$, $p < 0.001$). All 95% confidence intervals did not contain zero.

Table 3 illustrates the direct and indirect effect sizes of the model. The total effect was found to be 0.28, with a 95% confidence interval of [0.2398, 0.3221]. The direct

Table 1. Descriptive statistics and correlations of the main study variables

Variable	M	SD	1	2	3	4
1 PPC	2.14	0.79				
2 SC	3.47	0.61	−0.195***			
3 DPA	1.60	0.25	0.198***	−0.281***		
4 PG	1.94	0.76	0.287***	−0.337***	0.447***	

Note. ***$p < 0.001$.

Table 2. The chain mediation model

Predictor variable	Outcome variable	R	R^2	F	β	t	Boot LLCI	Boot ULCI
Eq. (1)		0.27	0.07	53.93				
PPC	SC				−0.19***	−8.66	−0.23	−0.14
Gender					−0.20***	−4.65	−0.29	−0.12
Age					0.10***	7.58	0.07	0.12
Eq. (2)		0.34	0.12	67.36				
PPC	DPA				0.15***	6.86	0.10	0.19
SC					−0.26***	−12.06	−0.30	−0.22
Gender					−0.26***	−6.20	−0.35	−0.18
Age					−0.01	−1.01	−0.04	0.01
Eq. (3)		0.54	0.29	167.84				
PPC	PG				0.18***	9.17	0.14	0.21
SC					−0.21***	−10.28	−0.25	−0.17
DPA					0.34***	16.95	0.30	0.38
Gender					−0.21***	−5.58	−0.29	−0.14
Age					−0.04***	−3.59	−0.06	−0.02

Note. ***$p < 0.001$.

Table 3. The direct and indirect effects in the chain mediation model

Effect types	Effect	Boot SE	95% CI
Total effect	0.28	0.02	[0.2398–0.3221]
Direct effect	0.18	0.02	[0.1391–0.2148]
Total indirect effect	0.10	0.01	[0.0831–0.1252]
PPC→SC→PG	0.04	0.01	[0.0270–0.0511]
PPC→DPA→PG	0.05	0.01	[0.0341–0.0653]
PPC→SC→DPA→PG	0.02	0.00	[0.0117–0.0219]

effect of PPC on PG was 0.18, with a 95% confidence interval of [0.1391, 0.2148]. The total indirect effect was 0.10, with a 95% confidence interval of [0.0831, 0.1252]. Specifically, the indirect effect through SC to PG was 0.04 (95% CI: [0.0270, 0.0511]), and the indirect effect through DPA to PG was 0.05 (95% CI: [0.0341, 0.0653]). Additionally, the indirect effect through SC to DPA and then to PG was 0.02 (95% CI: [0.0117, 0.0219]). None of the 95% confidence intervals overlapped zero, confirming the statistical significance of all effects.

Discussion

Consistent with H1, the findings show that PPC affects adolescents' PG, supporting previous research (Ji et al., 2024; Wang et al., 2022; Nielsen et al., 2020; Lin et al., 2020). Adolescents exposed to high levels of PPC tend to experience a compromised sense of autonomy, which may result in heightened rebellious behaviors (Glasser, 1999). This is especially pronounced during adolescence, a developmental stage characterized by a heightened need for independence. In response to excessive PPC, adolescents may react by rejecting parental constraints and engaging in problem behaviors, including PG. PG may serve as a way for adolescents to regain a sense of control over their lives, especially when they feel constrained by parental oversight. Because video games offer an alternative reality with fewer immediate restrictions, they can provide a sense of mastery and autonomy that adolescents may lack in their familial relationships, thereby facilitating escapism and emotional regulation (Coutelle et al., 2024). Furthermore, in the context of Chinese culture, which emphasizes collectivism, both parents and children may have a higher tolerance for psychological control, often perceiving it as an expression of care, involvement, and loyalty. Despite this cultural framework, the detrimental effects of PPC on adolescents' PG remain evident. This finding supports the idea that even in collectivist cultures, where psychological control may align with family values

of interdependence, the negative consequences of such control on adolescent development, particularly in relation to externalizing behaviors like PG, are still significant.

Supporting H2, the findings suggest that SC significantly mediates the relationship between PPC and PG. This result aligns with previous research, which demonstrates that elevated PPC can undermine adolescents' SC, making them more susceptible to impulsive and dysfunctional behaviors, such as excessive gaming (Bai et al., 2020; Hu et al., 2025). When adolescents' autonomy needs are frustrated, they are more likely to seek alternative means of asserting control over their lives. In the context of this study, reduced SC can be seen as a consequence of restricted autonomy due to PPC, leading adolescents to seek out immediate rewards, such as gaming, as a way to regain a sense of control and gratification.

Consistent with H3, the findings of this study suggest that DPA mediates the connection between PPC and PG. In particular, PPC leads to greater involvement of adolescents with deviant peer groups. Elevated levels of PPC can hinder adolescents, particularly those in their adolescence, from satisfying their psychological needs, especially the need for autonomy. When adolescents perceive that their autonomy and other needs are more important than maintaining a positive relationship with their parents, they are more likely to exhibit rebellious behavior and choose to defy their parents (Glasser, 1999). This rebelliousness often manifests in increased affiliation with deviant peer groups. Furthermore, DPA can lead to an increase in externalizing problem behaviors. According to Social Group Theory (Harris, 1995), when adolescents form relationships with deviant peers, they tend to adopt the behaviors and norms of the group in order to fit in. As a result, their behaviors, such as truancy, smoking, or other problem behaviors, align with the deviant peer group's values. The peer pressure and the desire for social acceptance within these groups can escalate adolescents' externalizing behaviors, including PG.

The results indicate that PPC influences adolescents' PG through a chain mediating effect involving both SC and DPA. Thus, H4 was supported. Ecological Systems Theory posits that the components of various systems interact with one another and ultimately affect an individual's development (Bronfenbrenner, 1986). As an element of the family subsystem, PPC impacts the development of adolescents' SC systems. When parents engage in psychological control rather than rational guidance, adolescents may experience a sense of diminished autonomy and competence during their interactions with their parents, which can lead to a negative emotional state. This, in turn, hinders the development of their SC abilities. Adolescents with low SC are more likely to disregard social norms, making them more susceptible to the influence of peer groups that promote a hedonistic and irresponsible lifestyle. Such adolescents are attracted to, identify with, and ultimately join deviant peer groups that share these values. Once they form affiliations with these deviant peers, the peer group further influences their behavior. Interaction with deviant peers provides adolescents with models for inappropriate behavior and encourages the adoption of deviant behaviors, thus increasing the likelihood of engaging in addictive behaviors such as PG.

A key contribution of this research is the establishment of a chain mediation model, which reveals how PPC not only affects adolescents' SC but also indirectly impacts their peer affiliations, ultimately leading to PG. By integrating Ecological Systems Theory and Choice Theory, this investigation emphasizes the intricate interaction between family dynamics, individual regulatory mechanisms, and peer influences, advancing our understanding of the pathways through which family factors can shape maladaptive behaviors in adolescents. Moreover, this study sheds light on the sequence of developmental processes, from parental control to self-regulation and peer selection, that contribute to PG, emphasizing the role of both personal and social factors in adolescent behavior. From a practical perspective, this study underscores the importance of intervention strategies aimed at enhancing adolescents' SC and reducing DPA. Interventions that focus on improving SC, such as self-regulation training and emotional management programs, may help mitigate the adverse effects of PPC on adolescent behavior. Additionally, addressing the role of peer influences is crucial, as DPA has been shown to further exacerbate PG. Practical programs that promote healthy peer relationships, encourage positive social connections, and discourage engagement with deviant peers could be vital in reducing the risk of adolescents developing PG. Furthermore, this research suggests that family-based interventions that foster more supportive and autonomy-affirming parenting practices could be beneficial in preventing or mitigating PG. By targeting both individual and family-level factors, interventions can offer a more holistic approach to addressing adolescent gaming addiction.

Several limitations of this study should be acknowledged. First, the reliance on self-report instruments may introduce measurement bias, particularly concerning the assessment of PG, a negatively valenced behavior. Participants may underreport such behaviors due to social desirability concerns. Future research would benefit from incorporating multi-informant assessments, such as peer nominations or reports, to enhance the validity and objectivity of the measurements. Second, the cross-sectional design precludes any conclusions about causal directionality. Future studies should adopt longitudinal designs or experimental paradigms capable of disentangling the temporal ordering and dynamic interplay among these constructs. Third, the sample was restricted to adolescents from a specific cultural context, China, where collectivist values and intensive parental involvement are particularly salient. As such, the extent to which these findings generalize to adolescents from other age groups or sociocultural backgrounds remains an open question. Replication and extension across diverse developmental stages and regions are warranted to establish the broader applicability of the findings.

Conclusion

In conclusion, the present study examined the relationship between PPC and PG by testing the mediating roles of SC

and DPA. The results showed that PPC influenced PG not only directly, but also indirectly through the independent mediating effects of SC and DPA, as well as through the serial mediating pathway from SC to DPA. By identifying both separate and sequential mediating pathways, this study provides a more comprehensive understanding of how PPC affects PG and offers useful implications for future research and practical interventions targeting PG.

Acknowledgement: Not applicable.

Funding Statement: The author received no specific funding for this study.

Availability of Data and Materials: The data are available from the corresponding author upon reasonable request.

Ethics Approval: All research procedures followed were in accordance with the ethical standards of the World Medical Association (Declaration of Helsinki) for experiments involving human subjects. All conducted procedures received approval from the ethical committee of the Academic Ethics and Moral Committee of Xinxiang Vocational and Technical College (Decision No. 045 of 2025). Both student assent and parental consent were obtained after clarifying the voluntary nature of the study and the confidentiality of responses.

Conflicts of Interest: The author declares no conflicts of interest.

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