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Parental Psychological Control and Internet Gaming Disorder Tendency: A Moderated Mediation Model of Core Self-Evaluation and Intentional Self-Regulation

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ABSTRACT

Internet gaming disorder (IGD) among junior high school students is an increasingly prominent mental health concern. It is important to look for influences behind internet gaming disorder tendency (IGDT) in the junior high school student population. The present study aimed to reveal the explanatory mechanisms underlying the association between parental psychological control (PPC) and internet gaming disorder tendency among junior high school students by testing the mediating role of core self-evaluation (CSE) and the moderating role of intentional self-regulation (ISR). Participants in present study were 735 Chinese junior high school students who completed offline self-report questionnaires on parental psychological control, core self-evaluation, intentional self-regulation, and Internet gaming disorder tendency. Analyses were conducted via mediation and moderated mediation. The results showed that: (1) Parental psychological control was positively related to junior high school students' Internet gaming disorder tendency. Core self-evaluation, and intentional self-regulation were negatively related to junior high school students' Internet gaming disorder tendency, respectively. (2) Core self-evaluation partially mediated the relationship between parental psychological control and junior high school students' Internet gaming disorder tendency. (3) Intentional self-regulation moderated the association between parental psychological control and Internet gaming disorder tendency, as well as the relationships between parental psychological control and core self-evaluation and core self-evaluation and Internet gaming disorder tendency in the mediated model. Based on these findings, we believe that there is a need to weaken parental psychological control, strengthen junior high school students' core self-evaluation and intentional self-regulation, and to recognize the important role of parents as well as their children's personal positive traits in the healthy development of junior high school students.

KEYWORDS

Internet gaming disorder tendency; parental psychological control; core self-evaluation; intentional self-regulation; moderated mediation model; junior high school students

Introduction

With the development of information technology, more and more young people use the Internet for their daily study,

life, and entertainment. By June 2023, the number of Internet users in China had reached 1.079 billion, ranking first in the world, with 13.9 percent of them aged 10 to 19 [1]. Although the Internet brings many benefits, it also has



negative effects on adolescents. For example, excessive playing of online games may pose risks to vulnerable and susceptible groups such as adolescents [2–6].

Internet gaming disorder (IGD) refers to the phenomenon that individuals spend a lot of time and energy repeatedly and continuously playing games, eventually resulting in impaired physical, mental and social functions [7]. Junior high school students in adolescence are a susceptible population and this period is accompanied by a series of changes in physical, hormonal, psychological and social development [8]. IGD can lead to a range of negative consequences for junior high school students, such as depression, anxiety, decreased academic performance, lack of a sense of meaning in life, poor sleep quality [9–11], and even psychological and social functioning of the individual produce serious trauma [12,13]. According to previous studies, the proportion of junior high school students in China who can be diagnosed with IGD is probably between 2.2% and 21.5% [14], most junior high school students have not reached the addiction standard but have different degrees of internet gaming disorder tendency (IGDT).

Family is the earliest and most important external living environment for junior high school students in their growth process, and it is also an important ecosystem for their physical and mental quality development. And parental psychological control (PPC), which is a negative parenting style of parents to their children in the family environment, often occurs in Chinese families [15] and is closely related to adolescents' psychological and behavioral problems [16,17]. Previous studies have explored the influence of PPC on IGD, however, the mechanisms of how PPC affects IGDT in the junior high school students have not been explored.

Core self-evaluation (CSE) is one of the positive psychological traits, is the most basic self-evaluation of an individual, including the evaluation of one's ability and value [18,19], which is closely related to the life events experienced by the individual and the life environment in which he or she lives. Individuals' CSE will be significantly reduced when they are impacted by too many stressful events [20,21]. According to the cognitive-behavioral model on pathological internet use, internet addiction is a maladaptive behavior due to the action of distal factors on proximal factors, which include life events or other stressors, etc., and lead to the emergence of maladaptive behavioral symptoms (e.g., internet addiction) by influencing proximal factors such as an individual's nonadaptive cognition (e.g., core self-evaluation) [22]. IGD is one of the subtypes of internet addiction, so does PPC, as a distal factor affect junior high school students' IGDT by acting on the proximal factor CSE?

Despite experiencing PPC, not all junior high school students will have high IGDT. Developmental contextualism theory suggests that it is the combination of the individual and the environment that determines an individual's ultimate behavioral outcomes, and that the psychological states and behavioral responses that poor home environmental factors cause in an individual will vary depending on the individual's self-regulation [23]. Intentional Self-Regulation (ISR) is an individual's ability to

regulate his or her own development in response to environmental resources, and as a positive individual characteristic, ISR interacts with both environmental factors and other individual factors to promote positive and reduce negative developmental outcomes in adolescents [24]. For example, one study found that adolescents' ISR acted as a moderator between negative life events and individual externalizing problems [25]. Thus, the moderating role of ISR in the relationship between PPC, CSE, and IGDT among junior high school students is also worth exploring.

Overall, this study will explore the IGDT faced by junior high school students and look for factors affecting the IGDT at both the family and individual levels, and explore the intrinsic influence mechanism between PPC, CSE, ISR and IGDT.

Parental psychological control and internet gaming disorder tendency

Parental acceptance-rejection theory (PAR Theory) can be used to explain the potential relationship between parental psychological control and internet gaming disorder. PAR Theory attempt to understand how early parental acceptance-rejection experiences influence children's behavioral development [26]. When parents of junior high school students exercise psychological control over their children with attitudes of rejection, indifference, and neglect, the children are unable to develop positive attachment relationships with their parents. When children do not receive an emotional attachment from their parents, they are likely to fulfill their emotional needs in other special ways, such as turning to the Internet for psychological fulfillment [27]. There is a pull effect and a push effect in the virtual world of internet games, and many adolescents are often attracted by its pull effect to make up for the missing feeling of being loved and respected in real life by immersing themselves in internet games, and they are also affected by the push effect to escape from the negative influences encountered in real life from their parents by playing games [28].

Ecosystem theory suggests that the growth of an individual is influenced by the interactions of various external environmental systems, with the family environment having the most direct and important influence on adolescents [29]. In China in particular, the persistence of family orientated values has a profound impact on the personal development of adolescents, especially on the formation of early attachments [30]. Due to limited educational resources and intense competition, Chinese parents have high expectations for their children's education, often demanding excellent academic performance, which puts enormous pressure on children [31,32] and also tends to create authoritarian family parenting styles. Junior high school students are in adolescence, their self-identity is being formed, and they desire to be independent, while the negative family upbringing style of parental psychological control can seriously hinder their development of autonomy, leading junior high school students to seek other compensations and increase the probability of addictive behaviors [33]. Numerous studies have found that parental psychological control positively predicts internalizing problems such as

depression, anxiety, and relational aggression in Chinese children and adolescents [34–36].

Parental psychological control, as a parenting style, is often presented as a predictor variable in correlational variable relationship studies, and most of them focus on aspects such as current and future problematic behaviors produced by PPC on children. In recent years, it has been shown that parents' regular use of psychological control, such as triggering feelings of guilt and withdrawal of love, can lead to a range of undesirable behaviors in their children [37] and even lead to more serious addictive tendencies in adolescents and young children [38]. A study by Jiang et al. [17] found that PPC can lead to the aggravation of smartphone addiction in adolescents. Deng et al. [39] even found the direct relationship between PPC and IGD in adolescents, i.e., PPC perceived by adolescents at different points in time was positively correlated with adolescent' IGD.

To summarize, PPC is an important external environmental influence factor of junior high school students' IGDT. Based on the PAR Theory, ecological systems theory, and the results of previous empirical studies, this study proposes hypothesis 1: PPC may be positively associated with junior high school students' IGDT.

Core self-evaluation as the mediator

According to the psychological mediation framework, negative situations or life events can affect an individual's attitudes, beliefs, or perceptions, which thereby affects their psychological or behavioral characteristics [40]. The model includes a distal stress process, which refers to exposure to negative life events or negative situations, such as negative parenting styles [41], and a proximal process, which refers to an individual's subjective vigilance when encountering negative life events or situations. It manifests as internalized negative attitudes, beliefs, or perceptions. When individuals process external information, they subjectively believe that others will reject them, discriminate against them, and treat them unfairly. In previous studies, CSE was an important aspect of the proximal process [19].

Judge et al. [42] first proposed the concept of CSE, which was defined as the most basic and comprehensive evaluation of an individual's intrinsic value and ability, and an instinctive and broad personality structure. Adolescents' CSE has significant external dependence and situational significance. When individuals experience more stressful events, their CSE will be negatively affected [21]. At the same time, negative influences from the family, such as negative parenting style, will have a negative impact on the children's CSE. Yang et al. [43] found that the more parents adopted positive parenting styles, such as being warm and understanding towards their children, the higher their children's CSE scores; conversely, the lower their CSE scores.

Previous research suggests that individuals with low CSE have lower positive emotions, higher negative emotions, and higher social anxiety [44], and are more likely to adopt avoidance coping strategies [45]. Playing internet games can bring people happy emotions and satisfaction with accomplishments [46], which is an avoidance coping strategy often adopted by adolescents.

There is still a lack of research that directly discusses the mediating mechanism of CSE between PPC and IGDT among junior high school students. Based on the guidance of previous studies and the psychological mediation framework, this study proposes hypothesis 2: CSE may play a mediating role in the influence of PPC on junior high school students' IGDT.

Intentional self-regulation as the moderator

It is worth considering that although PPC may influence junior high school students' IGDT, not every junior high school student is seriously affected, suggesting that there may be an influence of moderating variables between the two. According to developmental contextualism theory, individual's behavior is not determined by a single system but is influenced by the interaction between the individual and the environment. Even under the influence of the same environment, the next actions taken by individuals will differ due to differences in self-regulation [23]. Therefore, individual factors may modify parents' influence on junior high school students and play a moderating role.

ISR is a process of self-initiated control and regulation of one's own behavior that is triggered by individual factors, and a large number of cross-sectional and longitudinal studies have demonstrated its link to adolescent development. Adolescents' ISR can not only promote their mental health development, but also reduce the risk of aggression and addiction [47]. The high ISR ability possessed by an individual will play a protective role when he/she experiences unfavorable events and environments, mitigating the adverse effects caused of risk factors on him/her. For example, empirical studies have found that left-behind children with high ISR can buffer the impact of peer bullying on their suicidal ideation in the external environment system [48].

In combination with the developmental contextualism theory and previous research findings, this study predicts that ISR can buffer the negative influence of PPC and reduce adolescents' IGDT. Therefore, this study proposes hypothesis 3: ISR may moderate the direct path of "PPC → IGDT".

Empirical studies have found that ISR is significantly correlated with individual positive psychological quality, personality development, and psychological well-being [49]. Wu et al. [50] found that students' self-regulated learning ability has a mediating effect between academic anxiety and self-esteem, and students with low academic anxiety can improve their self-esteem by improving their self-regulation ability. Other studies have also found that the selection, optimization, and compensation strategies of ISR can improve the self-esteem of college students through physical exercise [51]. Self-esteem is a characteristic of CSE, and people with high self-esteem have more positive self-evaluations [52].

According to the risk-buffering hypothesis, an individual's protective resources (such as ISR) can both buffer the negative effects of risk factors and positively promote the individual's development [53]. As a protective resource, ISR has a beneficial role in the development of the individual's positive psychology, helping the individual to positively construct a goal system, reduce the emergence of

negative thoughts, increase the recognition and positive evaluation of oneself, better cope with negative evaluations and negative impacts brought by the external environment, and avoid the emergence of negative behaviors [54]. Individuals with high levels of ISR will have a higher opinion of themselves, and higher levels of core self-evaluation will reduce negative behaviors in junior high school students. On the contrary, individuals with low levels of ISR are less likely to buffer negative behaviors and are more likely to engage in risky behaviors. Yang et al. [48] found that ISR plays an important moderating role in the mediating process of “peer bullying → core self-evaluation → suicidal ideation” among left-behind children.

In summary, this study believes that junior high school students' ISR can moderate the relationship between PPC, CSE, and IGDT, as well as proposes hypothesis 4: ISR may play a moderating role in the mediating path of “PPC → CSE → IGDT”.

The present study

Existing studies provide support for exploring the relationship between PPC and IGDT as well as the role of CSE and ISR. Combined with ecological systems theory and PAR Theory, we built a moderated mediation model to test the following hypotheses: PPC may be positively associated with junior high school students' IGDT (H1); CSE may play a mediating role in the influence of PPC on IGDT (H2); ISR may moderate the direct path of “PPC → IGDT” (H3); ISR may play a moderating role in the mediating pathway of “PPC → CSE → IGDT” (H4). The theoretical hypothetical model is shown in Fig. 1.

Materials and Methods

Participants and procedure

Using the cluster sampling method, in December 2022, this study selected junior high school students from 2 public junior high schools in Qingdao, Shandong Province, China, and Shenzhen, Guangdong Province, China, as research subjects to investigate their level of PPC, CSE, ISR, IGDT, and their basic background information. We randomly recruited participants from each grade from 7th to 9th in two junior high schools in China. The research participants were briefed in detail about the precautions for answering the questionnaires, told to answer the questionnaires according to their own truthfulness, and emphasized the principle of confidentiality and the fact that the results of the study were for academic research only. The studies involving human participants were reviewed and approved

by the Research Ethics Committee of University of Jinan. Written informed consent to participate in this study was provided by the participant's legal guardian/next of kin. The questionnaires were uniformly collected by the researchers on the spot after the students had completed all the questionnaires. To ensure data quality, all data collected were carefully screened and invalid samples were excluded from the study. For example, questionnaires with incomplete responses, regular and linear responses, wrong answers to polygraph questions, and questionnaires that were not filled out according to the instructions of the questions. We finally collected 735 valid questionnaires from 770 primary questionnaires with a valid response rate of 95.45%. The questionnaire participants involved 301 students in grade 7 (40.95%), 264 students in grade 8 (35.92%), and 170 students in grade 9 (23.13%). The age range of all study subjects was from 12 to 16 years (M age = 13.92, SD age = 0.99). Of the participants, 358 (48.71%) were boys and 377 (51.29%) were girls.

Data were processed and statistically analyzed using SPSS25.0 and its PROCESS macro program (3.1) and Amos25.0 software. Correlation analysis, regression analysis, mediation effect analysis, moderated mediation effect analysis, and simple slope analysis were conducted to analyze the relationships between PPC, CSE, ISR, and IGDT among junior high school students.

Measures

Parental psychological control

The Chinese version of the Parental Psychological Control Scale (PPCS) compiled by Wang et al was used to assess PPC [15]. It consisted of 18 items divided into three dimensions: guilt induction, love withdrawal, and authority assertion. Guilt induction was elicited for 10 items (e.g., “My parents tell me that I should feel guilty when I do not meet their expectations.”). Love withdrawal contained 5 items (e.g., “My parents act cold and unfriendly if I do something they do not like.”). Authority assertion contained 5 items (e.g., “My parents tell me that what they want me to do is the best for me and I should not question it.”). A 5-point scale scored from 1 (totally inconsistent with) to 5 (in full compliance with) was used to survey the different levels in the scale. The higher the total scores, the stronger the individual's perceived PPC level. In this study, Cronbach's α of the scale was 0.93, and the fit indices of the model in the confirmatory factor analysis were $\chi^2/df = 3.15$, RMSEA = 0.05, GFI = 0.95, CFI = 0.98, TLI = 0.97, and NFI = 0.98, which indicated that the scale had great reliability and validity.

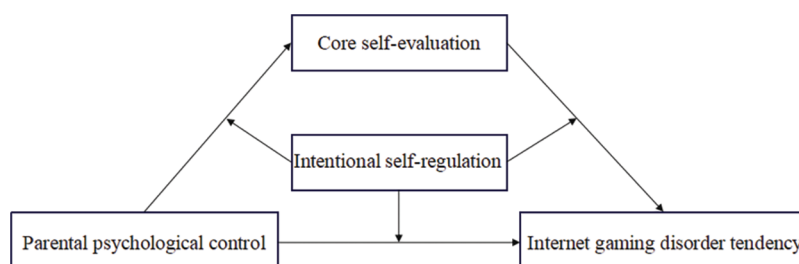


FIGURE 1. The theoretical hypothesis model.

Core self-evaluation

The Chinese version of the Core Self-Evaluation Scale (CSES) compiled by Judge et al. and revised by Du et al. was used to assess CSE [55,56]. Previous study has found that the scale's reliability and validity are affected by the reverse representation of the items [57]. Therefore, this study refers to the practice of Chen et al. [58]. Some of the reverse items in this questionnaire were changed to positive statements ("I often feel depressed" instead of "I don't always feel depressed"; "Sometimes when I fail, I feel worthless" instead of "I don't feel worthless when I fail"; "There are times when things look pretty bleak and hopeless to me" instead of "I don't feel that many things are bleak and hopeless"). The scale comprised 18 items and used a five-point scale scored from 1 (totally inconsistent with) to 5 (in full compliance with). The higher the total scores, the stronger the level of CSE. In this study, Cronbach's α of the scale was 0.89, and the fit indices of the model in the confirmatory factor analysis were $\chi^2/df = 3.03$, RMSEA = 0.05, GFI = 0.97, CFI = 0.98, TLI = 0.97, and NFI = 0.97.

Intentional self-regulation

The Intentional Self-Regulation Scale (ISRS) compiled by Gestsdóttir et al. the Chinese version analysed and revised by Dai [24,25], was used to assess ISR. Its 9 items were divided into three dimensions: goal selection, goal optimization, and goal compensation in the scale. There were two items tapped goal selection (e.g., "When I set a goal, I stick to it."), four tapped goal optimization (e.g., "I'll do my best to try different ways to achieve my aim."), and three tapped goal compensation (e.g., "When it's difficult to achieve goals, I look for other ways to achieve them."). A five-point scale scored from 1 (totally inconsistent with) to 5 (in full compliance with) was used to survey the scale's different levels. The higher the total scores, the higher the level of ISR. In this study, Cronbach's α of the scale was 0.81, and the fit indices of the model in the confirmatory factor analysis were $\chi^2/df = 3.18$, RMSEA = 0.05, GFI = 0.98, CFI = 0.98, TLI = 0.97, and NFI = 0.97.

Internet gaming disorder tendency

The Internet Gaming Disorder Scale (IGDS), which was adapted from the DSM-5 diagnostic criteria for internet gaming addiction by Petry et al. [59], was translated into Chinese by several psychology graduate students and read repeatedly to make it suitable for junior high school students' reading habits. The scale asks subjects to report the extent to which they match each of the nine items of the IGDT symptoms (e.g., "You think you should play fewer games, but it is difficult to reduce the amount of time you spend playing games"). A five-point scale scored from 1 (totally inconsistent with) to 5 (in full compliance with) was used to survey the scale's different levels. The higher the total scores, the more severe the individual's propensity for IGD. The Cronbach's α of the scale in the study was 0.88, and the fit indices of the model in the confirmatory factor analysis were $\chi^2/df = 2.46$, RMSEA = 0.05, GFI = 0.97, CFI = 0.98, TLI = 0.96, and NFI = 0.96, indicating that the scale had excellent reliability and validity.

Statistical analyzes

First, this study used Amos 25.0 to control for unmeasured latent method factor effects to measure whether there was a common method bias in the study [60]. The $p < 0.05$ was considered statistically significant. The results indicated that the addition of a common method factor to the four-factor model makes it a five-factor model ($\chi^2/df = 3.371$, CFI = 0.87, TLI = 0.856, RMSEA = 0.057, SRMR = 0.0475), the model fit index was not significantly improved ($\Delta\chi^2/df = 0.012$, $\Delta CFI = 0.021$, $\Delta TLI = 0.013$, $\Delta RMSEA = 0.001$, $\Delta SRMR = 0.012$). In addition, the results of the confirmatory factor analysis showed that the results of the single-factor model cannot reach the acceptable range ($\chi^2/df = 10.93$, GFI = 0.416, NFI = 0.404, IFI = 0.427, TLI = 0.399, CFI = 0.426, RMSEA = 0.116) and the degree of fit was poor. In conclusion, there was no significant common methodological bias in this study and further analysis could be conducted.

Next, our study used Pearson correlation analysis to test the study variables correlation. Grade and gender were also controlled for in the analysis. The moderated mediating model is tested by PROCESS version 3.1 [61]. Model 4 in PROCESS was used to test the mediating role of CSE (mediator) and Model 59 in PROCESS was used to test the moderated role of ISR (moderator). We used 5000 bootstrap samples and the 95% bias-corrected confidence interval (95% CI) to test the significance of the moderated mediating model [61].

Results

Preliminary analyzes

Table 1 presents the Pearson correlations, means, and standard deviations of all variables. As Table 1 indicates, PPC was positively correlated with IGDT. CSE and ISR were negatively correlated with PPC and IGDT.

Mediation analyzes

Model 4 of PROCESS [62] was used to detect an association between PPC and IGDT and a possible mediating role for CSE. Table 2 shows the results of the mediation analysis. After controlling for grade and gender, we found that PPC positively predicted their children's IGDT, $\beta = 0.19$, $p < 0.001$ (Mo. 1). Second, PPC negatively predicted CSE, $\beta = -0.33$, $p < 0.001$ (Mo. 2). Third, PPC positively predicted

TABLE 1

Descriptive statistics and correlations (N = 735)

Variables	M	SD	PPC	CSE	ISR	IGDT
PPC	2.75	0.91	1			
CSE	3.56	0.76	-0.33***	1		
ISR	3.72	0.57	-0.09*	0.50***	1	
IGDT	2.04	0.84	0.19***	-0.30***	-0.25***	1

Note: PPC, parental psychological control; CSE, core self-evaluation; ISR, intentional self-regulation; IGDT, internet gaming disorder tendency. * $p < 0.05$, *** $p < 0.001$.

TABLE 2

Mediating effect of CSE between PPC and ICDT (N = 735)

Predictors	Model 1 (IGDT)		Model 2 (CSE)		Model 3 (IGDT)	
	β	<i>t</i>	β	<i>t</i>	β	<i>t</i>
Grade	0.01	0.16	-0.05	-1.48	-0.01	-0.23
Gender	-0.52	-7.46***	-0.31	-4.53***	-0.60	-8.77***
PPC	0.19	5.31***	-0.33	-9.71***	0.10	2.78**
CSE					-0.26	-7.05***
R ²	0.10		0.14		0.16	
F	28.33***		40.29***		35.07***	

Note: PPC, parental psychological control; CSE, core self-evaluation; IGDT, internet gaming disorder tendency. ***p* < 0.01, ****p* < 0.001.

TABLE 3

Bia-corrected bootstrapping test in mediating effect

Pathways	Effect	95% confidence interval		Percentage
		Boot LLCI	Boot ULCI	
Direct path				
PPC → IGDT	0.10	0.03	0.17	52.63%
Indirect path				
PPC → CSE → IGDT	0.09	0.06	0.12	47.37%

Note: PPC, parental psychological control; CSE, core self-evaluation; IGDT, internet gaming disorder tendency.

IGDT, $\beta = 0.10, p < 0.01$, CSE negatively predicted IGDT, $\beta = -0.26, p < 0.001$ (Mo. 3). Finally, the mediation test indicated that the process by which PPC predicted IGDT through CSE was significant, indirect effect = 0.09, 95% CI = [0.06, 0.12],

TABLE 4

The moderation model

Predictors	Model 1 (CSE)		Model 2 (IGDT)	
	β	<i>t</i>	β	<i>t</i>
Grade	-0.10	-2.54	-0.03	-0.67
Gender	-0.26	-4.37***	-0.61	-8.96***
PPC	-0.30	-9.71***	0.14	3.70***
ISR	0.46	15.62***	-0.13	-3.38**
PPC × ISR	0.05	1.82 ⁺	-0.09	-2.68**
CSE			-0.16	-3.89***
CSE × ISR			-0.09	-2.67**
R ²	0.36		0.16	
F	83.32***		35.07***	

Note: PPC, parental psychological control; CSE, core self-evaluation; ISR, intentional self-regulation; IGDT, internet gaming disorder tendency. *p* < 0.05 < ⁺*p* < 0.1, ***p* < 0.01, ****p* < 0.001.

which are shown in Table 3. The results of the mediation analysis support H1 and H2.

Moderation analyzes

We used Model 59 of PROCESS [62] to examine whether ISR moderated the association between PPC and IGDT. Table 4 and Fig. 2 present the results of the moderation analysis. The regression model showed that the interaction between PPC and ISR was positively marginal associated with CSE ($\beta = 0.05, 0.05 < p < 0.1$) (Mo. 1); the interaction between PPC and ISR was negatively associated with IGDT ($\beta = -0.09, p < 0.01$) (Mo. 2); the interaction between CSE and ISR was negatively associated with IGDT ($\beta = -0.09, p < 0.01$) (Mo. 2).

In order to explain the moderating effect of ISR more clearly and intuitively, the present study adopted the “mean ± one standard deviation” method according to the previous practice of Dearing et al. [63] and set the scores of ISR one standard deviation above the mean as the high group, scores one standard deviation below the mean were set as the low group. A simple slope analysis and a simple effect plot were made for the moderating effect of ISR on the direct path of “PPC → IGDT” and the path of “PPC → CSE” “CSE → IGDT”, as shown in Figs. 3–5, respectively.

Simple slope tests showed that PPC did not significantly predict IGDT for students with high ISR ($\beta = 0.04, t = 0.91, p > 0.05$) and significantly positively predicted IGDT for students with low ISR ($\beta = 0.23, t = 4.23, p < 0.001$). Fig. 3 shows the interaction plot.

Simple slope tests showed that the effect of PPC on CSE was greater for junior high school students with low ISR (*b* simple = -0.35, *t* = -7.96, *p* < 0.001) than for junior high school students with high ISR (*b* simple = -0.24, *t* = -6.12, *p* < 0.001). Fig. 4 displays the interaction plot.

Simple slope tests showed that when the level of ISR was low, CSE did not significantly predict the IGDT ($\beta = -0.08, t = -1.36, p > 0.05$), whereas when the level of ISR was high, CSE significantly and negatively predict the IGDT ($\beta = -0.25, t = -5.04, p < 0.001$). Fig. 5 illustrates the interaction plot.

Discussion

Previous studies have mostly focused on finding the negative factors that trigger IGD, neglecting the exploration of effective positive factors that mitigate IGD. The present study therefore bridges these gaps by exploring the significant influence of PPC in family factors on IGDT, either directly or through CSE in individual factors, as well as the moderating role played by ISR as a resource for positive individuality in adolescents from the perspective of positive adolescent development. The results showed that CSE played a mediating role in the relationship between PPC and IGDT, the mediating effect of CSE was moderated by ISR.

Parental psychological control on internet gaming disorder tendency

In junior high school, students are in the “separation-individuation” phase where they hope to achieve self-independence by distancing themselves from their parents [64]. During this period, appropriate parental discipline can provide adolescents with the necessary guidance to keep

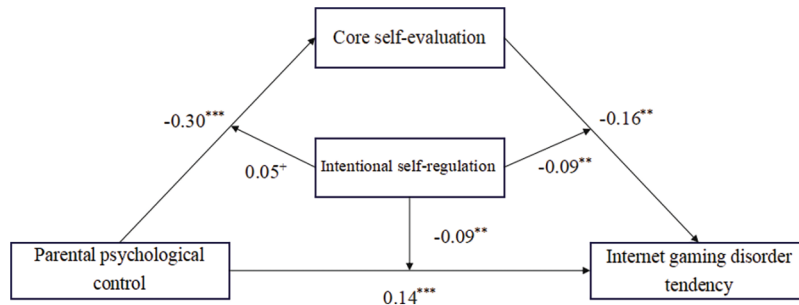


FIGURE 2. The integrated model.

Note: $0.05 < ^+p < 0.1$, $^{**}p < 0.01$, $^{***}p < 0.001$.

them on the right path. However, if parents discipline inappropriately, it can upset the inner balance of junior high school students, strengthen their sense of “separation-independence”, and ultimately lead to internet gaming disorder. According to the interpersonal or systematic models, when individuals feel the internal pressure brought by PPC, such as lack of care, strong feelings of guilt and forced compliance with authority, etc., many internalized and externalized problems can arise [65]. Junior high school students were more sensitive to the parenting behaviors of their parents [66]. Therefore, under the unhealthy parenting atmosphere of PPC for a long time, junior high school students would perceive that the emotional connection between their parents would become weaker, and a poor parent-child relationship could positively predict junior high school students’ IGDT [67]. Previous study findings that

parenting styles are associated with adolescents’ internet gaming disorder [68]. For instance, Qi et al. discovered that all three dimensions of parental control had a positive predictive effect on adolescent smartphone and internet disorder [69]. Our study results showed PPC of junior high school students positively and significantly predicts IGDT. The findings reveal the importance of parenting styles and that parents should weaken psychological control in order to reduce their children’s IGDT.

The mediation of core self-evaluation

Attachment theory suggests that when parents are overly controlling and fail to meet their children’s needs, children would develop anxious or avoidant attachment, which can lead to negative CSE [70,71]. The PPC that parents enact on their children is intrinsically emotionally manipulative in nature, resulting in the child behaving in a manner consistent with the parent’s wishes in order to gain the parent’s love and approval. This undesirable and frequent manipulation of internal emotions can essentially suppress junior high school students’ autonomy, prevent them from expressing themselves freely, create doubts about their own abilities, and have low self-evaluation, which in turn makes it difficult for them to develop good CSE skills. Some studies have found that positive parenting styles of fathers and mothers positively predicted CSE [72], while others have found that negative or poor parenting styles would reduce CSE of junior high school students [73].

CSE played a mediating role between negative events and adolescents’ internalizing and externalizing problems [74]. For example, CSE has been found to buffer the effects of peer alienation on adolescents’ internet deviant behavior [75]. The psychological mediation framework has suggested

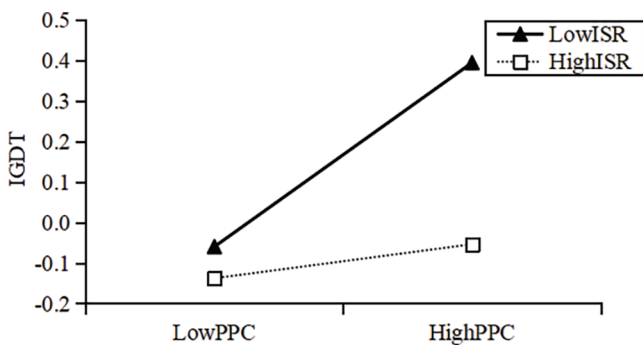


FIGURE 3. The interaction of parental psychological control and intentional self-regulation on internet gaming disorder tendency.

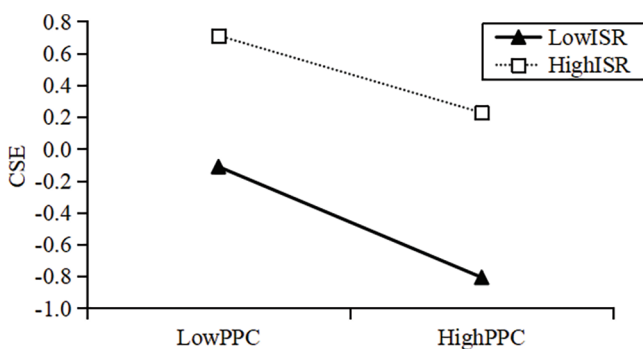


FIGURE 4. The interaction of parental psychological control and intentional self-regulation on core self-evaluation.

Note: PPC, parental psychological control; CSE, core self-evaluation; ISR, intentional self-regulation.

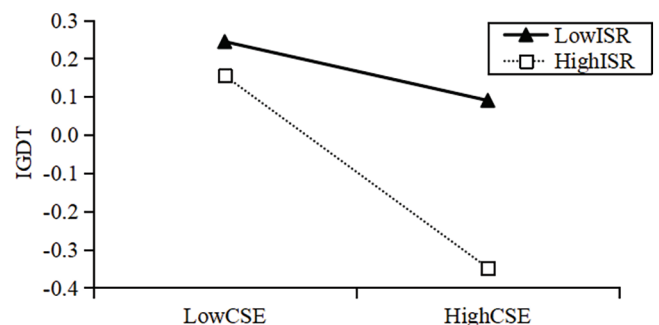


FIGURE 5. The interaction of core self-evaluation and intentional self-regulation on internet gaming disorder tendency.

that negative life events affect an individual's cognition, which thereby affects their psychological or behavioral characteristics [40]. For junior high school students, PPC is a negative family influence factor that affects their self-cognition (CSE), which thereby affects their behavior (IGDT). Lu et al. also found that CSE has a significant negative predictive effect on internet disorder [76]. The results showed that the mediation model holds, and that PPC not only directly affects junior high school students' IGDT, but also indirectly affects their IGDT through CSE, with the mediation effect accounting for 47.37% of the total effect. Therefore, in order to reduce junior high school students' IGDT, we can improve their CSE.

The moderation of intentional self-regulation

The moderation of "parental psychological control → internet gaming disorder tendency"

Previous studies have demonstrated that community risk factors could significantly predict psychological and emotional symptoms such as depression and anxiety for individuals with low ISR, but this predictive effect was not significant for individuals with high ISR [77]. Yu et al. also found that when adolescents have less access to teacher support, peer support, and opportunities for autonomy at school [47], ISR could moderate the negative effects of this adverse school climate on adolescents' feelings of loneliness. When levels of ISR were low, its effect of mitigating external adversity was diminished. Our results showed that ISR played a moderating role in the influence of PPC on IGDT. The simple slope test of ISR showed that PPC could significantly increase the level of IGDT among junior high school students with low ISR, but this effect was not significant in the high ISR group. This suggests that PPC is more likely to affect middle school students' IGDT when ISR levels are low, whereas PPC's effect on their IGDT can be effectively suppressed when ISR levels are high.

The research results of this paper further supported the developmental contextualism theory [23] and confirmed the influence of the interaction of the external environment (parental psychological control) and individual characteristics (intentional self-regulation) on the final developmental outcome of individuals. Junior high school students with high ISR could buffer the adverse effects of PPC in a bad environment and reduce the emergence of problem behaviours. That is, when high PPC prevents junior high school students from satisfying their basic psychological needs, junior high school students with high ISR are still able to actively mobilize their own resources to maintain a high degree of autonomy and a certain degree of self-regulation, and according to the reality, coordinate their goals and actions with the environment, to a certain extent, buffer the negative impact of PPC on themselves, and thus reduce IGDT. If the ISR ability is well developed, PPC may not affect the IGDT of junior high school students. On the contrary, individuals with low ISR had a relatively low ability to mobilize self-regulation resources, which led to the inability to effectively reduce the adverse effects of PPC on their IGDT.

The moderation of "parental psychological control → core self-evaluation → internet gaming disorder tendency"

The theory of Conservation of Resources and risk-buffering hypothesis models suggest that ISR acts as a protective factor to buffer the threat of risk factors to individuals [78–80]. When junior high school students encountered risk factors from the home environment (parental psychological control), individuals with high levels of ISR were equivalent to having protective guards against external threats, actively using their own resources, responding to unfavorable parental pressures through self-regulation, and maintaining high levels of autonomy, thus reducing the likelihood of impaired CSE, and protecting the development of CSE. On the contrary, individuals with low ISR were less likely to mobilize their self-regulatory capacities to adjust their goals and actions when under authoritative PPC, resulting in lower levels of CSE. Our results showed that in the first half of the pathway, CSE declined more rapidly with increasing PPC in low ISR junior high school students than in high ISR, i.e., the negative predictive effect of PPC on CSE was stronger in low ISR junior high school students. It was weaker in junior high school students with high ISR.

The switching-adherence model suggests that individuals can still rationally regulate their emotional state and make cognitive shifts after experiencing adversity. When confronted with negative events, they can adjust in time and transform them into positive opportunities. This leads to the development of rational and enduring lifestyles, which maintains optimism and produces positive psychological and social adaptations [81]. Junior high school students with high levels of ISR were more likely to experience positive self-transformation and self-persistence, stimulate appropriate and reasonable self-evaluation, and face their parents with more positive attitudes after experiencing PPC. They believe in their value and preciousness, and would not underestimate and abandon themselves, thus preventing their internet gaming disorder behavior and reducing the IGDT. Relevant studies also pointed out that ISR had a buffering effect on the influence of PPC on adolescents' risk-taking behavior [82]. Our results showed that in the second half of the path, the simple slope test showed that for junior high school students with low ISR, their CSE had no significant negative predictive effect on IGDT. For junior high school students with high ISR, this predictive effect was significant. The higher the CSE, the lower the IGDT. This indicated that the buffering effect of CSE on IGDT was significant only for individuals with high ISR. It could be said that ISR strengthened the protective effect of CSE, and the moderating effect between CSE and IGDT was "icing on the cake", and "adding wings to a tiger".

In summary, our results showed that ISR moderated the mediating role of CSE by moderating the first and second half pathways of the influencing process of "PPC → CSE → IGDT", and a moderated mediation model was established. Therefore, this also suggested that for junior high school students who suffer from PPC, we should pay attention to taking measures to help them effectively improve the ability of ISR, so as to reduce the occurrence of IGD. There are studies using ChatGPT, an advanced generative model based on

artificial intelligence, to improve students' critical, creative and reflective thinking skills [83]. This is because ChatGPT may provide students with feedback and guidance to help them gain a deeper understanding of their personal competence development [84]. This reveals that schooling can invoke such techniques to improve junior high school students' ISR.

Limitations and Implications

This study combines the family level and the individual level to explore the influencing factors of IGDT and its mechanism of action in junior high school students, and has achieved some meaningful and valuable research results, but there are also the following limitations that need to be noted: First, there are limitations in terms of the research object. This study only collected data on some junior high school students in two provinces of China, and the objects of the study were selected from the more economically developed coastal provinces, which could not accurately represent the overall junior high school student population and the representativeness was not high. Second, the cross-sectional research survey used in this study makes it difficult to make reliable causal inferences about the relationships between variables, and future studies can actively use longitudinal tracing or cross-modelling to enhance causal inference and analysis in empirical studies of IGDT. Third, we can also consider adding other variables. Whether the influence of junior high school students' PPC on IGDT is influenced by other factors besides the variables in this study needs to be further explored in future studies.

The theoretical and practical implications of this study are as follows. From a theoretical point of view, based on the developmental contextualism theory, the parental acceptance-rejection theory, and the risk-buffering model, it provides empirical support for the influence of PPC on junior high school students' IGDT, and enriches the findings of related theories. The protective and risk factors of junior high school students' IGDT and their influencing process are explored to further demonstrate the complex interactions between the family environment and individual factors, as well as their influence on individual psychology, social adaptation, and behavior, and to broaden the research perspective on junior high school students' IGDT. By incorporating CSE and ISR factors at the individual level, we constructed a moderated mediation model to reveal the influence mechanism of PPC on junior high school students' IGDT, which enriched the research results on junior high school students' IGDT.

From a practical point of view, based on the current situation that junior high school students commonly use internet games and their disorder tendency is becoming more and more prominent, it is important to understand the causes of IGDT of junior high school students, and then intervene and control the source to prevent the occurrence of internet gaming disorder. This study explores the mechanism of IGDT of junior high school students from PPC, which can guide parents, schools, and society in seeking measures to reduce the IGDT of adolescents.

Conclusion

The study investigates the relationship between parental psychological control and Internet gaming disorder tendency in junior high school students, with the mediating effect of core self-evaluation and the moderating role of intentional self-regulation by constructing a moderated mediation model. Our results suggest that parental psychological control was positively related to junior high school students' Internet gaming disorder tendency and that core self-evaluation partially mediated this association. In addition, intentional self-regulation moderated the association between parental psychological control and Internet gaming disorder tendency, as well as the relationships between parental psychological control and core self-evaluation and core self-evaluation and Internet gaming disorder tendency in the mediated model.

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Availability of Data and Materials: The raw data supporting the conclusions of this article will be made available by the author, without undue reservation.

Ethics Approval: The studies involving human participants were reviewed and approved by the Research Ethics Committee of University of Jinan. Written informed consent to participate in this study was provided by the participant's legal guardian/next of kin.

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