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FULL-LENGTH REPORT



How does parents' psychological distress relate to adolescents' problematic gaming? The roles of parent-adolescent relationship and adolescents' emotion regulation

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ABSTRACT

Background and Aims: Emerging research has identified parents' psychological distress as a potential risk factor that increases adolescents' vulnerability to problematic gaming. This study attempted to address "why" from a relational perspective. We hypothesized that parents' psychological distress may link to adolescents' problematic gaming through the mediation of parent-child relationship quality, while the mediating effects of parent-child relationship quality may vary depending on adolescents' emotion regulation. *Methods:* We collected data from 4,835 parent-child dyads in China (parental age = 41.45 ± 4.53 years; adolescent age = 13.50 ± 1.00 years). Structural Equation Modeling (SEM) was utilized to analyze the relationships among the variables under study. *Results:* Parent-reported parental depression/anxiety was related to worse adolescent-reported parent-child relationship, which in turn related to more severe adolescent-reported problematic gaming. Moreover, the mediating effects of parent-child relationship quality were weaker when adolescents used more expressive suppression (but not cognitive reappraisal). *Discussion and Conclusions:* The findings of this study highlight the need to consider both parent-child relationships and adolescents' active role in their own emotion regulation in order to understand parental influence on adolescent problematic gaming.

KEYWORDS

problematic gaming, parental depression, parental anxiety, emotion regulation, Chinese adolescents

INTRODUCTION

Despite the multiple merits of playing video games, problematic or addictive use among adolescents has been a matter of growing global concern due to its associations with psychosocial, academic, mental, and physical problems (e.g., Brunborg et al., 2013; see review, King, Del-fabbro, Billieux, & Potenza, 2020). The eleventh revision of the International Classification of Diseases (ICD-11; World Health Organization, 2019) has recognized gaming disorder as a formal diagnosis, while the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) also considers it as a condition worthy further clinical research and experience (American Psychiatric Association [APA], 2013). Despite an ongoing debate over the core diagnostic features of gaming disorder, Castro-Calvo et al.'s (2021) study using the Delphi approach suggests that essential features of gaming disorder include loss of control over gaming, gaming despite harm, conflict due to gaming, and remarkable functional impairment.

Adolescents are considered vulnerable to problematic gaming. Previous review studies have pointed out a higher prevalence of problematic gaming among youth compared with

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other age groups (Stevens, Dorstyn, Delfabbro, & King, 2021), with a prevalence rate of 8.8% and 10.4% among adolescents and young adults, respectively (Gao, Wang, & Dong, 2022). Adolescents are experiencing multiple stressors, while having not yet developed the ability to control their excessive use of digital and video games (King et al., 2020). The risk factors or stressors that might increase adolescents' vulnerability to problematic use include but not are limited to intrapersonal problems (e.g., loneliness, poor academic performance), interpersonal challenges (e.g., lack of social support, poor peer relationship), and adverse family environment (e.g., family dysfunction, lower school engagement) (for meta-analysis review, see Gao et al., 2022; Zhuang et al., 2023). Emerging research has pinpointed another risk – parents' mental health problems. For instance, several studies found that the severity of problematic gaming among adolescents was concurrently and positively associated with parental depression (Lam & Cheng, 2022; Mun & Lee, 2021; Wartberg et al., 2017) and parental anxiety (Wartberg et al., 2017). Also, Jeong et al. (2021) demonstrated that compared with adolescents without emotional problems and depressed parents, those with either or both difficulties were more likely to be classified as addicted gamers one year later. However, the findings were not entirely consistent. Rikkers, Lawrence, Hafekost, and Zubrick (2016) did not find a difference in the prevalence of problematic gaming between adolescents whose parents had medical history of mental problems and those with diagnosis-free parents. Similarly, Wartberg et al. (2017) did not find cross-lagged effects of parental depression and anxiety on adolescents' problematic gaming over a one-year period.

There are two possible explanations that may reconcile the inconsistent results. First, parents' psychological distress may be a distal factor that affects adolescents' problematic gaming through a proximal factor (i.e., indirect effect), and thus the direct effect might be invisible. Additionally, not all adolescents are equally susceptible to the influences of parental psychological distress and thus there is a boundary condition for the effects of parental psychological distress.

This study attempted to address the above-mentioned possibilities from a relational perspective based on the Emotional Security Theory (Cummings & Davies, 1999). Specifically, we proposed that parents' psychological distress may become a risk factor of adolescent problematic gaming because it possibly impairs parent-child relationship. Moreover, systems theories (Bronfenbrenner, 1979; Lerner et al., 2021) contend that adolescents are not passively subjected to parental influence; instead, they play an important role in regulating such environmental influences. Thus, we also considered adolescents' active role in face of parental psychological distress. Past studies (for a review, see Marchica, Mills, Derevensky, & Montreuil, 2019) have suggested that emotion regulation may help reduce problematic gaming. It is thus likely that the mediating effect of parent-child relationship quality may depend on adolescents' use of emotion regulation strategies. We explained this "regulated relational hypothesis" in the following paragraph.

The mediating role of parent-child relationship quality

Emotional Security Theory (EST; Cummings & Davies, 1999), initially derived from attachment theory (Bowlby, 1988), contends that children's emotional security derives from multiple family relationships (including parent-child relationship quality) and plays an important role in their developmental adjustment (Cummings & Warmuth, 2019). Adolescents who perceive their family relationships to be unstable, unresponsive, insecure, or filled with conflicts are more likely to engage in maladaptive behavior (Cummings, Schermerhorn, Keller, & Davies, 2008), while excessive gaming can be one of them.

Parents with distress symptoms may threaten children's emotional security and make children more likely to develop negative representations of family relationships (Cummings et al., 2008). The impaired cognitive functioning, diminished ability to regulate affect, and deficits in relationship management of parents may make them disengage from positive parenting, thwarting supportive parent-child interaction (Albers, Müller, Mehring, & Romer, 2020; Papp, Cummings, & Goeke-Morey, 2005). Symptomatic parents likely make negative and critical appraisals of their children, display negative affect, and use maladaptive parenting styles, which possibly disrupts parent-child relationship quality (Goodman & Gotlib, 1999; Wilson & Durbin, 2010). Supporting this notion, previous studies have found that depressed parents tended to be more intrusive (Mun & Lee, 2023) or neglectful in their discipline (Mun & Lee, 2021) and hostile toward their children (Sellers et al., 2014; for meta-analysis review, see Wilson & Durbin, 2010), while anxious parents tended to be more overprotective and controlling (Borelli, Margolin, & Rasmussen, 2015) but less warm and autonomy-supportive (Moore, Whaley, & Sigman, 2004; Van Der Bruggen, Stams, & Bögels, 2008).

Gaming may serve as a coping strategy in the context of impaired relationships, although such a coping strategy might be maladaptive, and excessive gaming might result in fewer chances to develop healthy approaches to coping with stressors in the long run (Kuss & Griffiths, 2012). Researchers have pointed out that engaging in video games helps adolescents escape from reality in response to familial difficulties and distress (see Nielsen, Favez, & Rigter, 2020; Schneider, King, & Delfabbro, 2017). The model of compensatory Internet use (Kardefelt-Winther, 2014) also contends that unfavorable life experiences or circumstances can motivate adolescents to turn to the online world as a means of alleviating negative emotions or seeking social support. However, such escape or compensatory use possibly makes them more prone to developing dysfunctional patterns of video game use. Indeed, a systematic literature review (Nielsen et al., 2020) has found negative and significant associations between parent-child attachment (including parent-child relationship quality) and children's problematic gaming in 10 out of 14 studies, notwithstanding a small effect size. Altogether, it is plausible that parents' psychological distress may heighten the risk of



problematic gaming among adolescents through the mediation of disrupted parent-child relationship.

The moderating role of adolescents' use of emotion regulation strategies

Systems theories in developmental science (e.g., Ecological Systems Theory; Bronfenbrenner, 1979; Relational Developmental Systems Model; Lerner et al., 2021) have acknowledged that human development results from an interaction between individual and environmental factors (including parental factors). These theories contend that adolescents may modulate the parental influence on their development. Parents' psychological distress presumably creates an insecure emotional environment (Cummings et al., 2008), while adolescents could use different emotion regulation strategies in response to this adversity.

Emotion regulation refers to the ability to manage and change individuals' emotional responses to meet ongoing demands of experience in order to achieve their goals (Matsumoto, Yoo, & Nakagawa, 2008). According to the process model of emotion regulation (Gross & John, 2003), cognitive reappraisal and expressive suppression are two commonly used emotion regulation strategies that represent antecedent-focused regulation and response-focused regulation, respectively. Reappraisal refers to reconsidering, reframing, and re-interpreting an emotional situation, which alters its emotional impact; suppression indicates inhibiting or not displaying a facial, verbal, or bodily expression of emotion (McRae, 2016). Although there is no universally adaptive strategy, studies have indicated that reappraisal (relative to suppression) generally brings about more desirable and healthy outcomes, such as better mental health and social functioning (see reviews, Hu et al., 2014; McRae, 2016). In contrast, using suppression might not effectively reduce negative emotions, and may even relate to a variety of psychological and health costs, since it consumes great cognitive resources and thwarts the authentic self (Gross & Cassidy, 2019). A meta-analysis has shown that suppression positively relates to anxiety and depressive symptoms among adolescents (Schäfer, Naumann, Holmes, Tuschen-Caffier, & Samson, 2017). Additionally, studies have demonstrated that reappraisal (but not suppression) can protect adolescents with adverse life experiences or life stressors from developing psychological and behavioral problems (for a review, see Daniel, Abdel-Baki, & Hall, 2020).

Accordingly, using more reappraisal (relative to suppression) may protect adolescents with symptomatic parents from developing an addiction to gaming through impaired parent-child relationship quality. For instance, when their parents demonstrate dysregulated emotions and behavior in their interactions, adolescents who are able to make sense of this situation may avoid provoking more conflicts with their symptomatic parents and thus protect their relationships. However, it is uncertain whether habitually suppressing their own emotions may backfire for Chinese adolescents with symptomatic parents, as the efficacy of suppression depends on cultural context (Matsumoto, Yoo, & Fontaine, 2008). Compared with cultures endorsing independence (e.g., Western White cultures), suppression has been documented to be more adaptive in cultures valuing interdependence (e.g., Eastern Asian cultures), wherein emotional control and restraint are emphasized and encouraged for the sake of social harmony (Butler, Lee, & Gross, 2007; Wei, Su, Carrera, Lin, & Yi, 2013). Therefore, we derived our hypotheses according to the process model of emotional regulation (Gross & John, 2003), but remained open to the possibility that suppression would play a culture-specific role. Specifically, we expected that when adolescents use more cognitive reappraisal (or possibly less expressive suppression), they would be more likely to minimize the harm of parental psychological distress on their parent-child relationship, and also less likely to develop problematic gaming associated with the impaired parent-child relationship.

Aims and hypotheses

To elucidate the association between parental psychological distress and adolescent problematic gaming, this study tested the "regulated relational hypothesis" (see Fig. 1) by using a large sample of Chinese parent-adolescent dyads. Specifically, we expected that parents' psychological distress indicated by depression and anxiety would positively relate to adolescents' problematic gaming (Hypotheses 1a and 1b) via the mediator of parent-child relationship quality (Hypotheses 2a and 2b). We also expected that adolescents' use of cognitive reappraisal and expressive suppression would moderate the effect of parental psychological distress on problematic gaming. We tested whether the effect of parental psychological distress on parent-child relationship quality (Hypotheses 3a and 3b) and the mediating effects

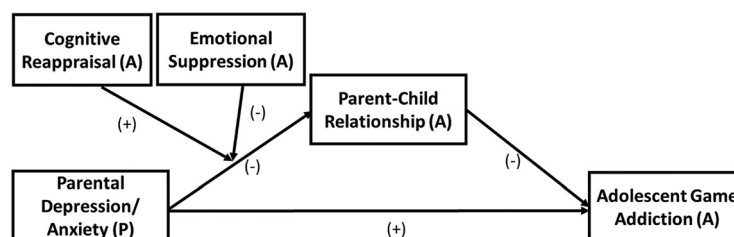
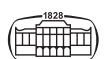


Fig. 1. Illustration of hypothesized relationships among key variables

Note: A indicates adolescent-report, P indicates parent-report; + indicates positive sign of coefficient, – indicates negative sign of coefficient.



(Hypotheses 4a and 4b) of parent-child relationship quality would be weaker when adolescents adopted more cognitive reappraisal or less expressive suppression.

METHODS

Participants and procedure

This study was conducted in 2019 before the Chinese government introduced an online gaming curfew for youngsters to curb online gaming addiction (Huaxia, 2021).¹ The electronic invitation was distributed to parents via 36 secondary schools in Shenzhen, an economically developed city in China. One parent and one adolescent child were invited to respond to an online survey. A total of 4,902 families with junior secondary school students participated in this study. We used a bogus item (i.e., I was born on February 30) to detect untrustworthy responses. Participants who provided a “yes” response to this item were removed from the data analyses, which resulted in 4,835 families with valid responses. The average age of parents (69.8% mothers) was 41.45 years old ($SD = 4.53$) and that of adolescents (45.5% females) was 13.5 years old ($SD = 1.00$) (for more information about data collection and participant characteristics, see Table S1 in supplementary materials).

Measures

Parents reported their distress symptoms as well as demographic information, and adolescents reported the severity of problematic gaming, parent-child relationship quality, academic performance, and basic personal information. We used Chinese-translated versions of the scales, which have been reliably used in other Chinese samples (e.g., Ding et al., 2022; Dong et al., 2022; Liu et al., 2020; Yang, Zhu, Chen, Song, & Wang, 2016; Yin et al., 2022). The internal consistencies of these scales were all good (see Table 1). Table S2 (in Supplementary Materials) shows the sample items. We took a mean score of the measure to represent the level of each variable.

Parental psychological distress. Parents’ psychological distress was indexed by depression and anxiety. First, depression was assessed by the depression module of the Patient Health Questionnaire-9 (PHO-9; Kroenke, Spitzer, & Williams, 2001). Parents rated the frequency of nine symptoms in the past two weeks on a 4-point scale (1 = *not at all*, 4 = *nearly every day*). Second, anxiety was assessed using a six-item version of the state scale of Spielberger State-Trait Anxiety Inventory (STAI; Marteau & Bekker, 1992; Spielberger, 1983). Parents rated the frequency of six

symptoms in the past two weeks on a 4-point scale (1 = *very rare*, 4 = *very often*).

Problematic gaming. Adolescents’ problematic gaming was measured by the seven-item version of the Game Addiction Scale (GAS-7), developed by Lemmens et al.’s (2009). This scale was created based on seven DSM-based criteria for pathological gaming, including salience, mood management, withdrawal, tolerance, relapse, conflicts, and problems. Adolescents indicated how often they had experienced each problem in the past six months on a five-point scale (0 = *never*, 4 = *always*). To provide greater variability, we adopted a symptom-based approach rather than a diagnostic approach to measure problematic gaming, with higher mean scores indicating more severe problematic gaming (see Festl, Scharkow, & Quandt, 2013).

Parent-child relationship quality. Adolescents reported their perceived parent-child relationship quality via the 12-item short version of the Inventory of Parent and Peer Attachment (IPPA) developed by Raja, McGee, and Stanton (1992) based on the original scale of IPPA (Armsden & Greenberg, 1987). Adolescents indicated how well each statement described communication, trust, and alienation in their parent-child relationship on a five-point scale (1 = *not true at all*, 5 = *very true*).

Use of emotion regulation strategies. Adolescents reported to what extent each emotion regulation strategy was true of them (1 = *not true at all*, 7 = *very true*) using the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). The ERQ contains six items for cognitive reappraisal and four items for expressive suppression.

Potential confounders. We controlled general demographic characteristics of participants (i.e., parental age, parental gender, parents’ education, family income, parents’ marriage status, adolescent gender, adolescent grade in school). Additionally, we controlled adolescents’ self-reported average academic performance on their latest examinations (1 = *under 60 points*, 5 = *over 90 points*).

Data analysis plan

First, we reported the prevalence of problematic gaming in the supplementary materials (see Table S3), although this is not of major interest in the current study. Second, to understand the preliminary relationships among key variables, we computed Pearson’s correlations via IBM SPSS26.0. Third, to elucidate how the risk of parental psychological distress translates to adolescents’ problematic gaming, we estimated a full mediation model via the Lavaan package in R program (Rosseel, 2012). As shown in Fig. 1, we tested both the direct effects of parental depression/anxiety on adolescents’ problematic gaming, as well as their indirect effects via the mediator of parent-child relationship quality. We controlled a series of demographic variables (i.e., parental age, parental gender, parents’ education levels, family income, parents’ marital status, adolescents’ grade in

¹Due to the heightened concern about gaming addiction of children and adolescents, Chinese government has issued strict regulations on youngsters’ video game usage since August 2021. This regulation required the gaming companies to implement a daily limit of 90 min on weekdays and three hours on weekends and holidays for their underage users.



Table 1. Means, standard deviations, and reliabilities of key variables

Variable	Mean	SD	Range	Skewness	Kurtosis	Cronbach's α
Parental depression	1.45	.53	1–4	.11	–.29	.93
Parental anxiety	2.03	.58	1–4	1.79	3.98	.76
Parent-child relationship	3.64	.78	1–5	–.14	–.44	.85
Adolescent problematic gaming	1.93	.89	1–5	.79	.10	.93
<i>Emotion regulation</i>						
Reappraisal	4.96	1.20	1–7	–.25	.14	.94
Suppression	4.30	1.31	1–7	.08	.01	.84

school, and adolescents' gender) and adolescent-reported academic performance. Maximum likelihood estimation was used to determine the values of the parameters. The bootstrapping approach (subsample = 5,000) was applied to estimate the 95% confidence intervals (CIs) of the path parameters, as well as indirect effects, direct effects, and total effects. The values were regarded as statistically significant if the 95% CI did not include zero (Hayes, 2013).

Further, we tested whether the indirect effects of parental depression/anxiety on adolescent problematic gaming via parent-child relationship quality varied depending on the levels of adolescents' use of emotion regulation strategies (i.e., moderated mediation). Specifically, the associations between parental depression/anxiety and parent-child relationship quality were contingent on adolescents' use of cognitive reappraisal and expressive suppression, respectively. To avoid multicollinearity and facilitate the interpretation of the effects, we standardized the values of parental depression, parental anxiety, adolescent reappraisal, and adolescent suppression within the sample. We also computed interaction terms as predictors, with parental psychological distress (i.e., depression or anxiety) multiplying adolescent emotion regulation strategies (i.e., reappraisal and suppression). Similarly, 95% CIs of the moderated mediation effects were estimated with 5,000 bootstrap samples. For model evaluation, we referred to the comparative fit index (acceptable fit: CFI ≥ 0.9), Tucker-Lewis Index (acceptable fit: TLI ≥ 0.9), and root mean square error of approximation (acceptable fit: RMSEA ≤ 0.08 ; Kline, 2005).

Ethics

The parents and adolescents who agreed to join this study completed the survey in a self-administrated manner by using their own electronic devices (e.g., tablet or smartphone). Before participating, both parents and adolescents had signed the informed consent form. Ethics approval was obtained from the ethics committee of Tsinghua Shenzhen International Graduate School, Tsinghua University.

RESULTS

Prevalence rate

We followed the scoring of Festl et al. (2013). Participants who chose "sometimes", "often" or "always" for at least four out of seven items were coded as problematic game users, and those

who chose these options for all seven items were coded as addicted game users. Accordingly, we found that 16.8% and 13.1% of the adolescents demonstrated symptoms of problematic and addictive gaming, respectively (see more results and discussion in Table S3 of supplementary materials).

Mediation analysis

As shown in Table 2, Pearson correlations showed that parents' depression and anxiety were negatively associated with adolescents' perceived parent-child relationship quality and positively associated with the severity of their problematic gaming (supporting Hypotheses 1a and 1b), and parent-child relationship was negatively associated with adolescents' problematic gaming. Furthermore, in the mediation models of parental depression (CFI = 0.999; TLI = 0.996; RMSEA = 0.009) and parental anxiety (CFI = 0.999; TLI = 0.996; RMSEA = 0.009), we found significant indirect effects of parental depression ($b = 0.086$) and parental anxiety ($b = 0.106$) (see Table 3). Specifically, parental depression ($b = -0.303$) and anxiety ($b = -0.345$) were negatively associated with parent-child relationship quality, which was in turn negatively associated with adolescent problematic gaming ($b = -0.284$; $b = -0.307$). Supporting Hypotheses 2a and 2b, these findings suggest that parental psychological distress relates to the severity of adolescents' addictive gaming through the impaired parent-child relationship. The direct effects of parental depression ($b = 0.342$) and parental anxiety ($b = 0.137$) on adolescent problematic gaming remained significant, suggesting that parent-child relationship quality was not the single mediator accounting for the effects of parental depression and parental anxiety.

Moderated mediation analysis

Moderated mediation models of parental depression (CFI = 0.989; TLI = 0.965; RMSEA = 0.020) and parental anxiety (CFI = 0.968; TLI = 0.934; RMSEA = 0.027) fitted the data well. The moderating effects and moderated mediation effects of reappraisal were not significant in both models, and thus did not support Hypotheses 3a and 3b (see Table 4). We found a significant interaction effect of parent depression and suppression ($b = 0.052$) and a significant interaction effect of parent anxiety and suppression ($b = 0.031$) on parent-child relationship quality. Also, we found significant moderated mediation effects of suppression in the models of parental depression ($b = -0.015$) and parental anxiety ($b = -0.005$). However, the findings were

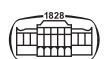


Table 2. Correlations among key variables and covariates

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Parental depression	.461 ^{***}												
2. Parental anxiety	-.307 ^{***}	-.243 ^{***}											
3. Parent-child relationship	.197 ^{***}	.285 ^{***}	-.336 ^{***}										
4. Adolescent problematic gaming	-.118 ^{***}	-.063 ^{***}	.289 ^{***}	-.064 ^{***}									
5. Reappraisal	.092 ^{***}	.119 ^{***}	-.096 ^{***}	.082 ^{***}	.166 ^{***}								
6. Suppression	-.026 ^{***}	.002 ^{***}	-.014 ^{***}	.025 ^{***}	.010 ^{***}	.001 ^{***}							
7. Parental age	.023 ^{***}	.062 ^{***}	-.025 ^{***}	.067 ^{***}	-.013 ^{***}	.023 ^{***}	.270 ^{***}						
8. Parental gender	-.147 ^{***}	-.069 ^{***}	.128 ^{***}	-.035 ^{***}	.048 ^{***}	-.093 ^{***}	.100 ^{***}	.072 ^{***}					
9. Parental education	-.153 ^{***}	-.105 ^{***}	.138 ^{***}	-.037 ^{***}	.070 ^{***}	-.073 ^{***}	.025 ^{***}	.022 ^{***}	.491 ^{***}				
10. Family income	-.026 ^{***}	-.046 ^{***}	.021 ^{***}	-.036 ^{***}	.025 ^{***}	-.028 ^{***}	-.051 ^{***}	-.042 ^{***}	-.016 ^{***}	.015 ^{***}			
11. Parents' marriage status	.043 ^{***}	.048 ^{***}	-.069 ^{***}	.042 ^{***}	-.016 ^{***}	-.003 ^{***}	.153 ^{***}	.002 ^{***}	-.027 ^{***}	-.024 ^{***}	.003 ^{***}		
12. Adolescent grade	.006 ^{***}	.021 ^{***}	.002 ^{***}	.262 ^{***}	.018 ^{***}	.043 ^{***}	.056 ^{***}	.174 ^{***}	.003 ^{***}	-.010 ^{***}	-.002 ^{***}	-.001 ^{***}	
13. Adolescents' gender	-.195 ^{***}	-.129 ^{***}	.271 ^{***}	-.238 ^{***}	.127 ^{***}	-.060 ^{***}	.031 ^{***}	-.020 ^{***}	.283 ^{***}	.248 ^{***}	.056 ^{***}	-.104 ^{***}	-.028 ^{***}
14. Adolescents' academic performance													

Note. Gender: 1 = male, 0 = female; marital status: 1 = married, 0 = other status (i.e., single, widowed, divorced, remarried); Adolescent grade (as a continuous variable): 1 = 7th grade, 2 = 8th grade, 3 = 9th grade; ^{*} $p < 0.05$, ^{**} $p < .01$, ^{***} $p < .001$.

inconsistent with Hypothesis 3b and 4b. Specifically, when adolescents used more suppression strategies, parents' depression and anxiety were less likely to link with their parent-child relationship quality which further related to their problematic gaming. The mediating effect of parent-child relationship quality was weaker at a high level of suppression (i.e., one SD above the mean), compared with the effect at a low level of suppression (i.e., one SD below the mean).

DISCUSSION

Adolescents are susceptible to problematic gaming, which has become a public concern (Fam, 2018). We investigated whether parental psychological distress is a risk factor for adolescent problematic gaming, and probed into its mechanisms by testing the “regulated relational hypothesis”. Results demonstrated that parent-reported depression and anxiety were associated with adolescent-reported problematic gaming through the mediation of adolescent-reported parent-child relationship quality. Furthermore, when adolescents used more expressive suppression to regulate emotion, their parent-child relationships were less likely to be affected by parents' distress, thus weakening the mediating effect of parent-child relationship quality. These findings contribute to the advancement of scientific research and bear significant practical implications.

This study highlights that parents' depressive and anxiety symptoms may elevate the risks for problematic gaming among adolescents and provides a potential account for understanding its mechanisms. Our findings add to the literature that has attempted to understand children and adolescents' addictive behavior in relation to parents' mental health status (e.g., Lam & Cheng, 2022; Mun & Lee, 2021, 2023). Furthermore, it might be through disruptions in parent-child relationship that parents' distress symptoms link to adolescents' elevated risk of problematic gaming. Previous studies have suggested that parent-child relationships may link parents' psychological distress to behavioral problems (McCarty & McMahan, 2003; Sellers et al., 2014). Symptomatic parents, who tend to withdraw from adaptive interactions with their offspring and display malfunctioning affect and behavior, probably impair their relationships with their adolescent offspring, at least in the eyes of the adolescents. Poor parent-child relationship quality can further increase the severity of problematic gaming because video gaming is an appealing coping strategy that allows individuals to escape from the frustrations of reality and compensate for their loss of warmth and support from family (Kardefelt-Winther, 2014). Although we could not exclude other possible mechanisms such as intergenerational transmission of mental problems (Lam, 2020), the relational perspective implies that to minimize parental influence of psychological distress, it is important to identify factors that protect the parent-child relationship.

Next, the present study extends the literature by including the role of adolescents' emotion regulation in the



Table 3. Results of mediation analyses

	Parental depression			Parental anxiety		
	B (SE)	p	95%CI	B (SE)	p	95%CI
PD/PA → PCR	−.303 (.020)	<.001	[−.344, −.265]	−.345 (.019)	<.001	[−.382, −.308]
PCR → AGA ^a	−.284 (.016)	<.001	[−.316, −.252]	−.307 (.016)	<.001	[−.339, −.276]
Indirect effect: PD/PA → PCR → AGA	.086 (.007)	<.001	[.072, .101]	.106 (.008)	<.001	[.091, .122]
Direct effect: PD/PA → AGA	.342 (.027)	<.001	[.288, .396]	.137 (.021)	<.001	[.095, .178]
Total effect	.428 (.028)	<.001	[.373, .481]	.243 (.021)	<.001	[.202, .284]

Note. PD = parental depression, PA = parental anxiety, PCR = parent-child relationship, AGA = adolescents’ problematic gaming. The covariates include parental age, parents’ gender, parents’ education, family income, parents’ marital status, adolescents’ grade, adolescents’ gender, adolescents’ self-reported academic performance; ^a Controlling for parental depression or parental anxiety.

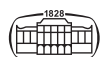
Table 4. Results of moderated mediation analyses

	Parental Depression			Parental Anxiety		
	B(SE)	p	95%CI	B	p	95%CI
PD → PCR	−.158 (.010)	.000	[−.177, −.138]	−.177 (.011)	.000	[−.198, −.156]
Reappraisal → PCR	.204 (.012)	.000	[.182, .227]	.197 (.011)	.000	[.175, .220]
Suppression → PCR	−.073 (.012)	.000	[−.097, −.051]	−.077 (.011)	.000	[−.100, −.054]
PD/PA × Reappraisal → PCR	−.019 (.010)	.068	[−.040, .001]	−.017 (.011)	.108	[−.039, .004]
PD/PA × Suppression → PCR	.052 (.010)	.000	[.032, .073]	.031 (.011)	.006	[.008, .052]
PCR → AGA ^a	−.284 (.016)	.000	[−.315, −.253]	−.159 (.008)	.000	[−.175, −.143]
Direct effect: PD/PA → AGA	.182 (.015)	.000	[.153, .211]	.041 (.006)	.000	[.029, .053]
Indirect effect	.045 (.004)	.000	[0.038, .052]	.028 (.002)	.000	[.024, .033]
Conditional indirect effect_reappraisal	.005 (.003)	.070	[.000, .011]	.003 (.002)	.109	[−.001, .006]
Conditional indirect effect_suppression	−.015 (.003)	.000	[−.021, −.009]	−.005 (.002)	.007	[−.008, −.001]
Total effect	.226 (.015)	.000	[.197, .256]	.069 (.006)	.000	[.057, .082]
Decompose interaction effect on PCR						
High suppression	−.105 (.013)	.000	[−.131, −.079]	−.146 (.016)	.000	[−.179, −.116]
Low suppression	−.210 (.016)	.000	[−.242, −.179]	−.207 (.015)	.000	[−.238, −.178]
Decompose conditional indirect effect						
High suppression	.030 (.004)	.000	[.022, .038]	.023 (.003)	.000	[.018, .029]
Low suppression	.060 (.006)	.000	[.049, .071]	.033 (.003)	.000	[.027, .039]

Note. PD = parental depression, PA = parental anxiety, PCR = parent-child relationship, AGA = adolescents’ problematic gaming; The covariates include parental age, parents’ gender, parents’ education, family income, parents’ marital status, adolescents’ grade, adolescents’ gender, adolescents’ self-reported academic performance. ^a Controlling for parental depression or parental anxiety. Bold numbers indicate significant moderation and moderated mediation effects.

pathway to problematic gaming. Going beyond theories that focus on parental influences on children’s behavioral problems (e.g., EST, Cummings et al., 2008), the current study highlights the importance of not only parent-child bonding but also adolescents’ active role in this process. Partially inconsistent with our expectations, expressive suppression rather than cognitive reappraisal acted as a buffer in the direct effects of parental psychological distress on adolescents’ problematic gaming and its indirect effects through parent-child relationship quality. This finding is also consistent with the literature that documents the “positive” role of suppression in the Chinese context where maintaining self-restraint for social harmony is highly valued (e.g., Wei et al., 2013). Moreover, past studies have suggested that in emotion-provoking situations, cognitive reappraisal that requires one to override original negative appraisal

depletes considerable self-control resource (Ortner, Corno, Fung, & Rapinda, 2018; Sheppes et al., 2014). Parents with psychological distress may frequently express negative emotions (Cummings, Cheung, & Davies, 2013), potentially evoking intense and negative emotional situations. It may be too demanding to use reappraisal. In contrast, expressive suppression can be helpful because it can change the environment by changing the interaction with parents. It is plausible that adolescents’ usage of expressive suppression (e.g., not displaying negativity to their symptomatic parents) helps to reduce parent-child conflict and facilitate communication. A past study found that expressive suppression could help to avoid the escalation of conflict within the relationship (van Kleef & Côté, 2007). However, as our study only investigated concurrent associations, we could not exclude the possibility that using suppression in the face of



parental psychological distress might bring about detrimental impacts in the long run. Therefore, inferences about the use of suppression should be made with caution.

Limitations and future directions

This study has several limitations. First, this study has a cross-sectional design and thus could not infer causal relationships of variables and confirm the directionality of the relationships. Previous research (e.g., Da Charlie, HyeKyung, & Khoo, 2011) has suggested that adolescents' problematic gaming possibly triggers deterioration of the parent-child relationship. However, Wartberg et al. (2017) found that adolescents' gaming disorder was not a significant predictor of parental anxiety over one year. Future studies will benefit from a longitudinal design to study the possible bidirectional relationship and trace the long-term influence of parental psychological distress on adolescents' development of problematic gaming. Second, this study did not differentiate online games from offline games. Future studies could examine whether online gaming (vs. offline gaming) provides more social resources to compensate for adolescents' deficit needs for affiliation and whether the link between parental psychological distress and adolescent problematic gaming may be strengthened in an online setting. Third, mothers (vs. fathers) are overrepresented in this sample. Mothers were more responsive than fathers to the invitation probably because mothers often served as the main caregivers. Although we did not find differences by parental gender in this study, future studies might explore if the effect of parental psychological distress differs by the role of the primary caregiver. Finally, we used single informant in this study, but the literature has pointed to a divergency between parent-report and adolescent-report, particularly on family relationships (De Los Reyes, Ohannessian, & Racz, 2019). To further test the generalizability of our hypothesis, future studies would benefit from involving multiple informants (see Pivetta et al., 2023).

CONCLUSION

Despite the aforementioned limitations, our study provides novel insights regarding the link between parental psychological distress and adolescent problematic gaming. The findings suggest that this link may be, in part, mediated by parent-child relationship quality, and that the strength of this link may depend on adolescents' use of expressive suppression as an emotion-regulating strategy. We hope to enlighten researchers to study other addictive behaviors from this regulated relational perspective. This study also suggests that practitioners should consider parents' mental health and children's emotion regulation in their prevention or intervention of adolescent problematic gaming. Practitioners should inquire about parents' mental health status when their adolescent clients show signs of being addicted to gaming. Although it may not be advisable to encourage those adolescents to inhibit their emotional expression, the

use of expression suppression in some situations might be helpful. Practitioners could discuss this strategy with those adolescents and pay more attention to their role in active regulation.

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SUPPLEMENTARY MATERIAL

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REFERENCES

- Albers, C. C., Müller, J. M., Mehring, K., & Romer, G. (2020). Is a mother's recalled parental rearing behavior, her attributions of her child's behavior, and her psychological distress associated with her mother-child relationship quality? *Infant Mental Health Journal*, 41(3), 378–392. <https://doi.org/10.1002/imhj.21850>.
- American Psychiatric Association, DSM-5 Task Force. (2013). *Diagnostic and statistical manual of mental disorders: DSM-5™* (5th ed.). American Psychiatric Publishing, Inc. <https://doi.org/10.1176/appi.books.9780890425596>.
- Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, 16(5), 427–454. <https://doi.org/10.1007/bf02202939>.
- Borelli, J. L., Margolin, G., & Rasmussen, H. F. (2015). Parental over-control as a mechanism explaining the longitudinal association between parent and child anxiety. *Journal of Child and Family Studies*, 24(6), 1559–1574. <https://doi.org/10.1007/s10826-014-9960-1>.
- Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. New York, NY: Basic Books.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press. <https://doi.org/10.1126/science.207.4431.634>.



- Brunborg, G. S., Mentzoni, R. A., Melkevik, O. R., Torsheim, T., Samdal, O., Hetland, J., ... Pallesen, S. (2013). Gaming addiction, gaming engagement, and psychological health complaints among Norwegian adolescents. *Media Psychology, 16*(1), 115–128. <https://doi.org/10.1080/15213269.2012.756374>.
- Butler, E. A., Lee, T. L., & Gross, J. J. (2007). Emotion regulation and culture: Are the social consequences of emotion suppression culture-specific? *Emotion, 7*(1), 30–48. <https://doi.org/10.1037/1528-3542.7.1.30>.
- Castro-Calvo, J., King, D. L., Stein, D. J., Brand, M., Carmi, L., Chamberlain, S. R., ... Billieux, J. (2021). Expert appraisal of criteria for assessing gaming disorder: An international Delphi study. *Addiction, 116*(9), 2463–2475. <https://doi.org/10.1111/add.15411>.
- Cummings, E. M., Cheung, R. Y., & Davies, P. T. (2013). Prospective relations between parental depression, negative expressiveness, emotional insecurity, and children's internalizing symptoms. *Child Psychiatry and Human Development, 44*(6), 698–708. <https://doi.org/10.1007/s10578-013-0362-1>.
- Cummings, E. M., & Davies, P. T. (1999). Depressed parents and family functioning: Interpersonal effects and children's functioning and development. In T. Joiner, & J. C. Coyne (Eds.), *The interactional nature of depression* (pp. 299–327). Washington, DC: American Psychological Association. <https://doi.org/10.1037/10311-011>.
- Cummings, E. M., Schermerhorn, A. C., Keller, P. S., & Davies, P. T. (2008). Parental depressive symptoms, children's representations of family relationships, and child adjustment. *Social Development, 17*(2), 278–305. <https://doi.org/10.1111/j.1467-9507.2007.00425.x>.
- Cummings, E. M., & Warmuth, K. A. (2019). Parenting and attachment. In M. H. Bornstein (Ed.), *Handbook of parenting* (3rd ed., pp. 374–400). Routledge. <https://doi.org/10.4324/9780429433214>.
- Da Charlie, C. W., HyeKyung, C., & Khoo, A. (2011). Role of parental relationships in pathological gaming. *Procedia-Social and Behavioral Sciences, 30*, 1230–1236. <https://doi.org/10.1016/j.sbspro.2011.10.238>.
- Daniel, S. K., Abdel-Baki, R., & Hall, G. B. (2020). The protective effect of emotion regulation on child and adolescent wellbeing. *Journal of Child and Family Studies, 29*(7), 2010–2027. <https://doi.org/10.1007/s10826-020-01731-3>.
- De Los Reyes, A., Ohannessian, C. M., & Racz, S. J. (2019). Discrepancies between adolescent and parent reports about family relationships. *Child Development Perspectives, 13*(1), 53–58. <https://doi.org/10.1111/cdep.12306>.
- Ding, R., Wu, N., Tang, S., Liu, T., Li, W., & Ni, S. (2022). Relations between parental response to children's negative emotions and suicidal ideation in Chinese adolescents: Internalizing problems, emotion regulation, and perceived relationship quality with parents as mediators. *Journal of Affective Disorders, 301*, 205–216. <https://doi.org/10.1016/j.jad.2022.01.043>.
- Dong, Z., Wang, P., Xin, X., Li, S., Wang, J., Zhao, J., & Wang, X. (2022). The relationship between physical activity and trait anxiety in college students: The mediating role of executive function. *Frontiers in Human Neuroscience, 16*, 1009540. <https://doi.org/10.3389/fnhum.2022.1009540>.
- Fam, J. Y. (2018). Prevalence of internet gaming disorder in adolescents: A meta-analysis across three decades. *Scandinavian Journal of Psychology, 59*(5), 524–531. <https://doi.org/10.1111/sjop.12459>.
- Festl, R., Scharrow, M., & Quandt, T. (2013). Problematic computer game use among adolescents, younger and older adults. *Addiction, 108*(3), 592–599. <https://doi.org/10.1111/add.12016>.
- Gao, Y. X., Wang, J. Y., & Dong, G. H. (2022). The prevalence and possible risk factors of internet gaming disorder among adolescents and young adults: Systematic reviews and meta-analyses. *Journal of Psychiatric Research, 154*, 35–43. <https://doi.org/10.1016/j.jpsychires.2022.06.049>.
- Goodman, S. H., & Gotlib, I. H. (1999). Risk for psychopathology in the children of depressed mothers: A developmental model for understanding mechanisms of transmission. *Psychological Review, 106*(3), 458–490. <https://doi.org/10.1037/0033-295X.106.3.458>.
- Gross, J. T., & Cassidy, J. (2019). Expressive suppression of negative emotions in children and adolescents: Theory, data, and a guide for future research. *Developmental Psychology, 55*(9), 1938–1950. <https://doi.org/10.1037/dev0000722>.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348–362. <https://doi.org/10.1037/0022-3514.85.2.348>.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guildford Press. <https://doi.org/10.1111/jedm.12050>.
- Huaxia (September 2, 2021). *Why China acts tough to limit online gaming for minors?* Xinhua NET. http://www.news.cn/english/2021-09/02/c_1310164734.htm [Accessed on 12 August 2023].
- Hu, T., Zhang, D., Wang, J., Mistry, R., Ran, G., & Wang, X. (2014). Relation between emotion regulation and mental health: A meta-analysis review. *Psychological Reports, 114*(2), 341–362. <https://doi.org/10.2466/03.20.PR0.114k22w4>.
- Jeong, H., Yim, H. W., Lee, S. Y., Lee, H. K., Potenza, M. N., & Park, M. (2021). Joint effects of children's emotional problems and parental depressive symptoms on the occurrence of internet gaming disorder among children and adolescents: A longitudinal study. *Journal of Behavioral Addictions, 10*(2), 244–252. <https://doi.org/10.1556/2006.2021.00030>.
- Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior, 31*, 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>.
- King, D. L., Delfabbro, P. H., Billieux, J., & Potenza, M. N. (2020). Problematic online gaming and the COVID-19 pandemic. *Journal of Behavioral Addictions, 9*(2), 184–186. <https://doi.org/10.1556/2006.2020.00016>.
- van Kleef, G. A., & Côté, S. (2007). Expressing anger in conflict: When it helps and when it hurts. *Journal of Applied Psychology, 92*, 1557–1569. <https://doi.org/10.1037/0021-9010.92.6.1557>.
- Kline, T. J. B. (2005). *Psychological testing: A practical approach to design and evaluation*. Thousand Oaks, CA: Sage.
- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of*



- General Internal Medicine*, 16(9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>.
- Kuss, D. J., & Griffiths, M. D. (2012). Online gaming addiction in children and adolescents: A review of empirical research. *Journal of Behavioral Addictions*, 1(1), 3–22. <https://doi.org/10.1556/JBA.1.2012.1.1>.
- Lam, L. T. (2020). The roles of parent-and-child mental health and parental internet addiction in adolescent internet addiction: Does a parent-and-child gender match matter? *Frontiers in Public Health*, 8, 142. <https://doi.org/10.3389/fpubh.2020.00142>.
- Lam, Y. T., & Cheng, C. (2022). Parental depression and leisure activity engagement on children's gaming disorder: A dyadic study. *International Journal of Environmental Research and Public Health*, 19(10), 5880. <https://doi.org/10.3390/ijerph19105880>.
- Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, 12(1), 77–95. <https://doi.org/10.1080/15213260802669458>.
- Lerner, R. M., Lerner, J. V., Murry, V. M., Smith, E. P., Bowers, E. P., Geldhof, G. J., & Buckingham, M. H. (2021). Positive youth development in 2020: Theory, research, programs, and the promotion of social justice. *Journal of Research on Adolescence*, 31(4), 1114–1134. <https://doi.org/10.1111/jora.12609>.
- Liu, Y., Wang, Q., Jou, M., Wang, B., An, Y., & Li, Z. (2020). Psychometric properties and measurement invariance of the 7-item game addiction scale (GAS) among Chinese college students. *BMC Psychiatry*, 20(1), 1–11. <https://doi.org/10.1186/s12888-020-02830-7>.
- Marchica, L. A., Mills, D. J., Derevensky, J. L., & Montreuil, T. C. (2019). The role of emotion regulation in video gaming and gambling disorder: A systematic review. *Canadian Journal of Addiction*, 10(4), 19–29. <https://doi.org/10.1097/CXA.000000000000070>.
- Marteau, T. M., & Bekker, H. (1992). The development of a six-item short-form of the state scale of the Spielberger State–trait Anxiety Inventory (STAI). *British Journal of Clinical Psychology*, 31(3), 301–306. <https://doi.org/10.1111/j.2044-8260.1992.tb00997.x>.
- Matsumoto, D., Yoo, S. H., & Fontaine, J. (2008). Mapping expressive differences around the world: The relationship between emotional display rules and individualism versus collectivism. *Journal of Cross-Cultural Psychology*, 39(1), 55–74. <https://doi.org/10.1177/0022022107311854>.
- Matsumoto, D., Yoo, S. H., & Nakagawa, S. (2008). Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology*, 94(6), 925–937. <https://doi.org/10.1037/0022-3514.94.6.925>.
- McCarty, C. A., & McMahon, R. J. (2003). Mediators of the relation between maternal depressive symptoms and child internalizing and disruptive behavior disorders. *Journal of family psychology*, 17(4), 545.
- McRae, K. (2016). Cognitive emotion regulation: A review of theory and scientific findings. *Current Opinion in Behavioral Sciences*, 10, 119–124. <https://doi.org/10.1016/j.cobeha.2016.06.004>.
- Moore, P. S., Whaley, S. E., & Sigman, M. (2004). Interactions between mothers and children: Impacts of maternal and child anxiety. *Journal of Abnormal Psychology*, 113(3), 471–476. <https://doi.org/10.1037/0021-843X.113.3.471>.
- Mun, I. B., & Lee, S. (2023). The impact of parental depression on children's smartphone addiction: A serial mediation model with parental neglect and children's self-esteem. *Social Science Computer Review*, 41(1), 217–233. <https://doi.org/10.1177/08944393211037579>.
- Mun, I. B., & Lee, S. (2021). The influence of parents' depression on children's online gaming addiction: Testing the mediating effects of intrusive parenting and social motivation on children's online gaming behavior. *Current Psychology*, 1–10. <https://doi.org/10.1007/s12144-021-01854-w>.
- Nielsen, P., Favez, N., & Rigter, H. (2020). Parental and family factors associated with problematic gaming and problematic internet use in adolescents: A systematic literature review. *Current Addiction Reports*, 7(3), 365–386. <https://doi.org/10.1007/s40429-020-00320-0>.
- Ortner, C. N., Corno, D., Fung, T. Y., & Rapinda, K. (2018). The roles of hedonic and eudaimonic motives in emotion regulation. *Personality and Individual Differences*, 120, 209–212. <https://doi.org/10.1016/j.paid.2017.09.006>.
- Papp, L. M., Cummings, E. M., & Goeke-Morey, M. C. (2005). Parental psychological distress, parent-child relationship qualities, and child adjustment: Direct, mediating, and reciprocal pathways. *Parenting: Science and Practice*, 5(3), 259–283. https://doi.org/10.1207/s15327922par0503_2.
- Pivetta, E., Costa, S., Antonietti, J., Marino, C., Billieux, J., & Canale, N. (2023). Adolescent internet gaming disorder and its association with parental behaviors: A dyadic study. *Addictive Behaviors*, 107602. <https://doi.org/10.1016/j.addbeh.2022.107602>.
- Raja, S. N., McGee, R., & Stanton, W. R. (1992). Perceived attachments to parents and peers and psychological well-being in adolescence. *Journal of Youth and Adolescence*, 21(4), 471–485. <https://doi.org/10.1007/BF01537898>.
- Rikkers, W., Lawrence, D., Hafekost, J., & Zubrick, S. R. (2016). Internet use and electronic gaming by children and adolescents with emotional and behavioural problems in Australia—results from the second Child and Adolescent Survey of Mental Health and Wellbeing. *BMC Public Health*, 16(1), 1–16. <https://doi.org/10.1186/s12889-016-3058-1>.
- Rossee, Y. (2012). Lavaan: An R package for structural equation modeling and more. Version 0.5-12 (BETA). *Journal of Statistical Software*, 48(2), 1–36. <https://doi.org/10.18637/jss.v048.i02>.
- Schäfer, J. Ö., Naumann, E., Holmes, E. A., Tuschen-Caffier, B., & Samson, A. C. (2017). Emotion regulation strategies in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of Youth and Adolescence*, 46(2), 261–276. <https://doi.org/10.1007/s10964-016-0585-0>.
- Schneider, L. A., King, D. L., & Delfabbro, P. H. (2017). Family factors in adolescent problematic internet gaming: A systematic review. *Journal of Behavioral Addictions*, 6(3), 321–333. <https://doi.org/10.1556/2006.6.2017.035>.
- Sellers, R., Harold, G. T., Elam, K., Rhoades, K. A., Potter, R., Mars, B., ... Collishaw, S. (2014). Maternal depression and co-occurring antisocial behaviour: Testing maternal hostility and warmth as mediators of risk for offspring psychopathology.



- Journal of Child Psychology and Psychiatry*, 55(2), 112–120. <https://doi.org/10.1111/jcpp.12111>.
- Sheppes, G., Scheibe, S., Suri, G., Radu, P., Blechert, J., & Gross, J. J. (2014). Emotion regulation choice: A conceptual framework and supporting evidence. *Journal of Experimental Psychology: General*, 143(1), 163–181. <https://doi.org/10.1037/a0030831>.
- Spielberger, C. (1983). *State-trait anxiety inventory*. Redwood City, CA: Mind Garden.
- Stevens, M. W., Dorstyn, D., Delfabbro, P. H., & King, D. L. (2021). Global prevalence of gaming disorder: A systematic review and meta-analysis. *Australian & New Zealand Journal of Psychiatry*, 55(6), 553–568. <https://doi.org/10.1177/0004867420962851>.
- Van Der Bruggen, C. O., Stams, G. J. J., & Bögels, S. M. (2008). Research review: The relation between child and parent anxiety and parental control: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, 49(12), 1257–1269. <https://doi.org/10.1111/j.1469-7610.2008.01898.x>.
- Wartberg, L., Kriston, L., Kramer, M., Schwedler, A., Lincoln, T. M., & Kammerl, R. (2017). Internet gaming disorder in early adolescence: Associations with parental and adolescent mental health. *European Psychiatry*, 43, 14–18. <https://doi.org/10.1016/j.eurpsy.2016.12.013>.
- Wei, M., Su, J. C., Carrera, S., Lin, S. P., & Yi, F. (2013). Suppression and interpersonal harmony: A cross-cultural comparison between Chinese and European Americans. *Journal of Counseling Psychology*, 60(4), 625. <https://doi.org/10.1037/a0033413>.
- Wilson, S., & Durbin, C. E. (2010). Effects of paternal depression on fathers' parenting behaviors: A meta-analytic review. *Clinical Psychology Review*, 30(2), 167–180. <https://doi.org/10.1016/j.cpr.2009.10.007>.
- World Health Organization (2019). *ICD-11: International classification of diseases* (11th revision). Retrieved from <https://icd.who.int/>.
- Yang, X., Zhu, L., Chen, Q., Song, P., & Wang, Z. (2016). Parent marital conflict and Internet addiction among Chinese college students: The mediating role of father-child, mother-child, and peer attachment. *Computers in Human Behavior*, 59, 221–229. <https://doi.org/10.1016/j.chb.2016.01.041>.
- Yin, L., Teklu, S., Pham, H., Li, R., Tahir, P., & Garcia, M. E. (2022). Validity of the Chinese language patient health questionnaire 2 and 9: A systematic review. *Health Equity*, 6(1), 574–594. <https://doi.org/10.1089/heap.2022.0030>.
- Zhuang, X., Zhang, Y., Tang, X., Ng, T. K., Lin, J., & Yang, X. (2023). Longitudinal modifiable risk and protective factors of internet gaming disorder: A systematic review and meta-analysis. *Journal of Behavioral Addictions*, 375–392. <https://doi.org/10.1556/2006.2023.00017>.

