

AKADÉMIAI KIADÓ

Journal of Behavioral Addictions

11 (2022) 3, 820–830

DOI:  
10.1556/2006.2022.00056  
© 2022 The Author(s)

FULL-LENGTH REPORT



# Longitudinal association between parental involvement and internet gaming disorder among Chinese adolescents: Consideration of future consequences as a mediator and peer victimization as a moderator

KAI DOU<sup>1</sup> , XUE-KE FENG<sup>1</sup> , LIN-XIN WANG<sup>1</sup> and JIAN-BIN LI<sup>2,3\*</sup>

<sup>1</sup> Research Center of Adolescent Psychology and Behavior, School of Education, Guangzhou University, Guangzhou, China

<sup>2</sup> Department of Early Childhood Education, The Education University of Hong Kong, Hong Kong S.A.R., China

<sup>3</sup> Center for Child and Family Science, The Education University of Hong Kong, Hong Kong S.A.R., China

Received: March 4, 2022 • Revised manuscript received: May 16, 2022; July 18, 2022 • Accepted: July 19, 2022  
Published online: August 22, 2022

## ABSTRACT

**Background and aims:** Internet gaming disorder (IGD) in adolescents is a concerning issue. Positive parenting has been found to protect against adolescent IGD, but the underlying mechanisms await further investigation. As such, this study examined the longitudinal association between parental involvement (PI) – a specific type of positive parenting understudied in the literature of adolescent gaming disorder – and IGD. Moreover, this study also tested consideration of future consequences (CFC) as a mediator and peer victimization (PV) as a moderator. **Methods:** A two-wave longitudinal research spanning 6 months apart was conducted. Participants were Chinese adolescents (final  $N = 434$ ; 222 females;  $M_{\text{age}} = 14.44$  years,  $SD = 1.56$ ). They provided ratings on PI, PV, and IGD at Wave 1, and CFC-immediate, CFC-future, and IGD at Wave 2. **Results:** Descriptive statistics showed that the prevalence rate of IGD was 10.81% and 9.45% at Waves 1 and 2, respectively. Moreover, results of moderated mediation model found that after controlling for Wave 1 IGD and covariates, Wave 1 PI was associated with Wave 2 IGD via preventing adolescents *who had higher levels of PV* from developing a tendency of CFC-immediate and via promoting adolescents *who had lower levels of PV* to develop a tendency of CFC-future. **Discussion and Conclusions:** Altogether, these results suggest that facilitative ecological systems (e.g., positive parenting and good relationships with peers) and personal strengths (e.g., positive future orientation) jointly contribute to the mitigation of adolescent IGD.

## KEYWORDS

gaming disorder, parenting, peer relationships, future time perspective, ecological system theory, youth

The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) incorporated the diagnostic criteria<sup>1</sup> for internet gaming disorder (IGD) for the first time in 2013, and IGD is the second behavioral addiction included in DSM-5 ([American Psychiatric Association, 2013](#)). DSM-5 characterizes IGD as “persistent and recurrent use of the Internet

\*Corresponding author.  
E-mail: [lijianbin@eduhk.hk](mailto:lijianbin@eduhk.hk)

<sup>1</sup>These diagnostic criteria include: preoccupation with gaming, withdrawal symptoms when gaming is taken away or not possible, the need to spend more time gaming to satisfy the urge, inability to reduce play or to quit gaming, giving up other activities due to gaming, continuing to game despite problems, deceiving family members or others about the amount of time spent on gaming, using gaming to relieve negative moods, and having risks for job or relationship due to gaming.



to engage in games, often with other players, leading to clinically significant impairment or distress” (American Psychiatric Association, 2013, p. 795). In the 11th Revision of the International Classification of Diseases (ICD-11), a broader term, namely gaming disorder (GD), is used because it is considered that gaming disorder can occur for both online and offline video games (World Health Organization, 2020). In this study, we use the term *IGD* to emphasize that what we focus on here is the gaming disorder that involves the use of internet. Clarifying this issue is important, as the terms IGD, GD, and other relevant terms (e.g., internet gaming addiction) have been often used interchangeably and this phenomenon has been criticized for making the field a chaos (Kuss, Griffiths, & Pontes, 2017).

Adolescents often spend a significant amount of time playing internet games (Gentile et al., 2017) but their impulsive control ability falters (Duckworth & Steinberg, 2015), which renders adolescents vulnerable to gaming addiction and disorder (Vollmer, Randler, Horzum, & Ayas, 2014; Yu, Mo, Zhang, Li, & Lau, 2021). IGD is associated with many negative outcomes in adolescents, including academic underachievement, disrupted sleep patterns, and internalizing and externalizing problems (for a review, see Paulus, Ohmann, Von Gontard, & Popow, 2018). Identifying the predictors and mechanisms of adolescent IGD is crucial, as the findings may inform prevention and intervention strategies. Based on Bronfenbrenner’s (1979) ecological system theory, many studies have examined the role of parenting in adolescent IGD (e.g., Cuong, Assanangkornchai, Wichaidit, Minh Hanh, & My Hanh, 2021; Su et al., 2018; Zhu & Chen, 2021), but several gaps await further investigation. First, the existing studies have focused primarily on negative parenting, but comparatively fewer studies have examined the role of *positive parenting* in adolescent IGD (Paulus et al., 2018). Among different types of positive parenting, parental involvement (PI) has received *even less* attention in the research of IGD (Nielsen, Favez, & Rigter, 2020). Second, IGD involves immediate gratification ignoring future consequences (American Psychiatric Association, 2013), suggesting that consideration for consequences (CFC) would be a potential, yet understudied, mediator. Third, relationships with peers become increasingly important during adolescence (Steinberg & Morris, 2001), but little is known about how family and peer systems jointly shape the development of IGD in adolescents. To help fill these gaps, this study aimed to examine the association between PI and adolescent IGD as well as to examine CFC as a mediator and peer victimization (PV) as a moderator.

## PARENTAL INVOLVEMENT AND INTERNET GAMING DISORDER

PI manifests in various ways, such as investing time and resources in child’s learning activities and personal life (Davidson & Cardemil, 2009; Wilder, 2014). Wu, Liu, Zou,

and Hou (2018) defined PI as parents’ cognitive, affective, and behavioral participation in the child-rearing process to foster the child’s healthy development. They developed a measure to assess multiple aspects of PI (e.g., schoolwork support, care) from adolescents’ own perspectives to avoid issues inherent in parent-report measures, such as parents’ exaggeration about their involvement and inconsistency between parent’s and the child’s perception.

According to the uses and gratification theory (Bulduklu, 2019; Katz, Blumler, & Gurevitch, 1974), the audiences consume social media (e.g., Facebook) to fulfill psychological needs, such as having fun, gaining recognition, getting connected with others, and escaping from real-world problems. Adequate PI relates to fulfillment of psychological basic needs (i.e., autonomy, competence, and relatedness), which, in turn, associate with better adjustment outcomes in adolescents (Costa, Sireno, Larcán, & Cuzzocrea, 2019). By contrast, inadequate PI relates to unmet psychological needs which further lead to poor adjustment (Costa, Cuzzocrea, Gugliandolo, & Larcán, 2016). Studies have found that unmet psychological needs drive adolescents to indulge in internet use and video gaming for compensation, including seeking psychological comfort, peer contact, and sense of self-worth (Fumero, Marrero, Bethencourt, & Penate, 2020; Li, Li, & Newman, 2013; Liu, Fang, Wan, & Zhou, 2016; Wang, Dou, Li, Zhang, & Guan, 2021).

Prior evidence has supported that positive parenting (e.g., perceived warmth, care, monitoring, and good parent-child relationship) is negatively associated with problematic internet use and IGD (Chen, Lee, Dong, Gamble, & Feng, 2020; Cuong et al., 2021; Su et al., 2018; Zhu & Chen, 2021), but only a handful of studies focused on PI. Among the limited number studies, Koc et al. (2020) found that adolescents diagnosed with IGD reported less PI compared to their non-diagnosed counterparts. Durkee et al. (2012) found that low level of PI was related to more maladaptive and pathological internet use in European adolescents. Cacioppo et al.’s (2019) study found that parents’ affective involvement was related to lower levels of problematic internet use. These studies pinpoint that PI-related components are negatively related to problematic internet use and IGD. However, these studies did not unanimously examine IGD, and they are predominately cross-sectional. Therefore, more investigation of the longitudinal association between PI and IGD with longitudinal design is highly needed.

## The mediation of consideration of future consequences (CFC)

CFC refers to “the extent to which individuals consider the potential distant outcomes of their current behaviors and the extent to which they are influenced by these potential outcomes” (Strathman, Gleicher, Boninger, & Edwards, 1994, p. 743). CFC consists of two dimensions, namely *CFC-Immediate* (CFC-I) and *CFC-Future* (CFC-F). People high in CFC-I care more about instant benefits and enjoyment but care little about possible upcoming negative consequences, whereas individuals high in CFC-F care about the



future and use long-term consequences to guide their current behavior, restraining the momentary enjoyment to avoid potential negative outcomes and to gain long-term benefits (Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008).

The social-ecological framework of future orientation considers that positive social-ecological environments (e.g., adequate involvement) facilitate, while negative environments (e.g., interpersonal conflicts) hinder, adolescents' thoughts and beliefs about the future (Johnson, Blum, & Cheng, 2014). Besides, the life history theory suggests that an individual likely adopts slow life history strategies that are conducive to self-control and delayed discounting if he/she lives in a safe environment, but an individual tends to adopt fast life history strategies that result in immediate gratification if he/she lives in a risky and unpredictable environment (Del Giudice, Gangestad, & Kaplan, 2016; Dunkel, Mathes, & Beaver, 2013). Few studies have directly examined the association between PI and CFC, but research that examines relevant terms suggests PI is possibly related to CFC. For instance, Wang, Geng et al. (2021) found that parental support related to higher levels of future time perspective in adolescents. Li et al.'s (2019) meta-analysis found that parental involvement related to more self-control.

The core symptoms of IGD include instant gratification and ignorance of the future (American Psychiatric Association, 2013). According to the buffering and susceptibility model, CFC-F buffers against self-control failure while CFC-I renders an individual susceptible to self-control failure (Joireman & King, 2016; Joireman, Shaffer, Balliet, & Strathman, 2012). In other words, adolescents high in CFC-F tend to resist the temptation and instant gratification of internet games and thus they may be less susceptible to IGD, whereas adolescents high in CFC-I enjoy instant gratification of internet games and thus they may be more susceptible to IGD. Hitherto, only a few studies have directly examined the association between CFC and IGD (e.g., Lukavská, 2012, 2018), but other studies focusing on problematic internet use have found that CFC-C and CFC-I is negatively and positive related to problematic internet use, respectively (Chittaro & Vianello, 2013; Kim, Hong, Lee, & Hyun, 2017; Labăr & Tepordei, 2019; Przepiorka & Blachnio, 2016).

Taken together, we believe that adequate PI would be related to less IGD in adolescents via preventing them from developing a tendency of CFC-I and via promoting them to develop a tendency of CFC-F. This suggests that CFC may serve as a mediator linking PI and IGD, but this idea has received little research and awaits more examination.

### The moderation of peer victimization

Besides parents, peers are another important source of social support for adolescents (Steinberg & Morris, 2001). Problematic peer relationships, such as peer victimization (PV), are a significant stressor that hinders adolescents' positive development, including poor well-being, problems behaviors, and suicidal ideation (Erath, Flanagan, &

Bierman, 2008; Reijntjes, Kamphuis, Prinzie, & Telch, 2010, 2011; Van Geel, Vedder, & Tanilon, 2014). Given the negative impacts of problematic peer relationships on adolescents' healthy development, it is promising to examine the extent to which PV shapes the direct and indirect associations between PI and IGD.

PV refers to the negative experiences of being verbally, physically, reputationally, and relationally bullied by peers in multiple forms (Harris, 2009). Based on the ecological system theory (Bronfenbrenner, 1979), studies have examined the interaction between family and peer systems on adolescent problematic internet use and IGD. Liang, Yu, Xing, Liu, and Chen (2021) found that adolescents reported fewer IGD symptoms when parental knowledge was high and PV was low. Zhai et al. (2019) study found the interplay between parents and peers was not directly, but indirectly through delinquent peer affiliation, associated with problematic internet use in adolescents.

Regarding CFC, Johnson et al. (2014) theorized that different ecological systems play critical role in shaping adolescents' future orientation. Although the said study does not explicitly mention whether different systems would work together to better predict future orientation, traditional ecological theories do have such a proposition (Bronfenbrenner, 1979). A few studies have supported this idea. For instance, Laghi, D'Alessio, Pallini, and Baiocco (2009) found that adolescents were more concerned about the future if both parent-child and peer relationships were good compared to those who reported only either or neither type of relationships was good. Based on the existing limited number of studies, it appears that PV would moderate the direct and indirect (through CFC) effects of PI on IGD, but no research has examined this idea so far.

### The present research

This longitudinal study attempts to bridge the aforesaid gaps by examining three questions. (1) To what extent does PI relate to IGD? (2) To what extent do CFC-I and CFC-F mediate the said association? And (3) To what extent are the direct and indirect effects of PI on IGD moderated by PV?

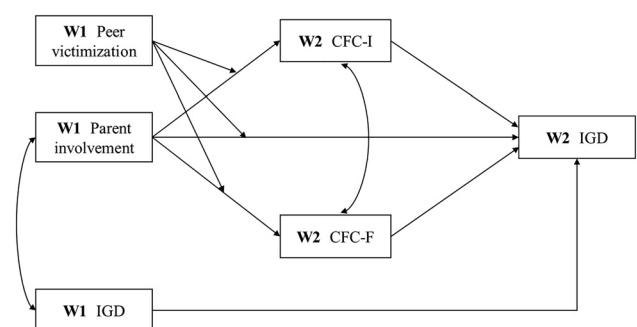


Fig. 1. Conceptual Moderated Mediation Model  
 Note: CFC-I = Consideration of future consequences-immediate, CFC-F = Consideration of future consequences-future, IGD = Internet gaming disorder. W1 = Wave 1, W2 = Wave 2.



These questions are combined into a moderated mediation model (Fig. 1). We hypothesize that: (1) PI would be negatively related to IGD; (2) the link between PI and IGD would be mediated by CFC-I and by CFC-F; and (3) the direct and indirect associations would be moderated by PV. Simultaneously examining the mediating and the moderating mechanisms not only accumulates deeper knowledge about *how* PI is related to IGD and *who* are susceptible to IGD, but the findings also have rich implications for how to mitigate adolescent IGD.

## METHOD

### Participants and procedures

This is a two-wave longitudinal research spanning 6 months apart. Participants were recruited from three middle schools in Guangzhou with a convenience sampling approach. At Wave 1 (W1), 444 participants (225 females) took part in the study. Among them, most mothers (80.0%) and fathers (91.0%) had at least a middle school diploma. At Wave 2 (W2), 434 (222 females;  $M_{\text{age}}=14.44$  years,  $SD=1.56$ ) took part in the study again. Similarly, most mothers (77.7%) and fathers (89.0%) had at least a middle school diploma. The dropout was due to students' absence from class on the day of measurement.

### Measures

**Parent involvement.** We measured PI at W1 with the Parent Involvement Scale (Wu et al., 2018). This scale has 22 items measuring adolescents' perception of parents' participation in terms of *emotion and leisure* (e.g., "Dad/Mom takes me on trips"), *discipline and reprimand* (e.g., "Dad/Mom corrects my wrong behavior"), *schoolwork support* (e.g., "Dad/Mom supervises me to do my homework"), and *daily care* (e.g., "Dad/Mom takes care of my life and living"). All items are rated on a 5-point scale (from 0=*never* to 4=*always*). A higher score indicates higher levels of PI. Cronbach's alpha was 0.95.

**Peer victimization.** We measured PV at W1 with the Peer Victimization Questionnaire (Nicholson, Chen, & Huang, 2018). This four-item scale measures how frequent participants had encountered different forms of peer victimization over the past month (e.g., "picked on you or said mean things to you"). Items are rated on a 5-point scale (from 0=*not once in past month* to 4=*every day*). A higher score indicates more peer victimization. Cronbach's alpha was 0.62. This Cronbach's alpha coefficient was relatively low, but still acceptable and comparable to the one found in prior studies (Eugene, Du, & Kim, 2021; Liu, Yang, Hu, & Zhang, 2020).

**Consideration of future consequences.** We measured CFC at W2 with the 12-item Consideration of Future Consequences Scale (Strathman et al., 1994). This scale has two dimensions: *CFC-I* (e.g., "I only act to satisfy immediate

concern, figuring the future will take care of itself") and *CFC-F* (e.g., "I consider how things might be in the future, and try to influence those things with my day-to-day behavior."). All items are rated on a 7-point scale (from 1=*extremely uncharacteristic of me* to 7=*extremely characteristic of me*). A higher score indicates higher levels of CFC-I or CFC-F. Cronbach's alpha was 0.78 for CFC-I and 0.73 for CFC-F.

**Internet gaming disorder.** We measured IGD at W1 and W2 with the scale used in Zhu, Zhang, Yu, and Bao (2015) study. In Zhu et al.'s (2015) study, they adapted Young's Internet Addiction Scale (Young, 1998) to measure young people's symptoms of internet addiction and disorder. This scale has been often used to measure IGD in prior studies (Kim, Lim et al., 2017; Peng, Cui, Wang, & Jiao, 2017; Su et al., 2018). The scale has 8 items (e.g., "do you feel occupied with the internet game (think about previous online game or anticipate next online game)?") binarily rated (0=*No*/1=*Yes*). A high score indicates more IGD symptoms. An individual would be qualitatively diagnosed as IGD if he/she gets a score of 5 or above (Feng, Ramo, Chan, & Bourgeois, 2017). Cronbach's alpha of this scale was 0.76 at W1 and 0.80 at W2.

**Covariates.** We collected participants' demographic information at W1, including student gender (1=*male*, 2=*female*), student age, and parents' educational levels (1=*primary school*, 2=*middle school*, 3=*undergraduate*, 4=*master or above*). These variables were included as covariates given their impacts on adolescent IGD (Zhu et al., 2015).

### Statistical analysis

We conducted preliminary analyses with SPSS 26.0. We first conducted attrition analysis by comparing W1 variables and covariates between participants who took part in both waves (i.e., the complete group) and those who dropped out at W2 (i.e., the attrition group). Then, we performed descriptive statistics and bivariate correlation among variables. Subsequently, we conducted primary analysis by fitting a moderated mediation model as illustrated in Fig. 1 with *Mplus* 8.3 (Muthén & Muthén, 1998–2017). A maximum likelihood approach was used. All paths were simultaneously estimated, controlling for W1 IGD and demographic variables. If the interaction effect between PI and PV on W2 IGD and/or CFC was significant, we further probed the simple slopes and the conditional mediation effects of CFC-I/CFC-F between participants with higher levels of PV ( $M+1SD$ ) and those with lower levels of PV ( $M-1SD$ ). We employed bootstrapping ( $N=10,000$ ) and its 95% confidence interval (CI) to judge the significance of (conditional) mediation effects.

### Ethics

The study was approved by the ethics committee of the Research Center of Adolescent Psychology and Behavior, School of Education, Guangzhou University, Guangzhou,





China (Protocol number: GZHU2019017). Parents' consent and participants' assent were obtained. The questionnaires were administered using the paper-and-pencil format in the class. Trained postgraduate students majoring in psychology hosted the administration. Voluntary participation was emphasized, and no incentives were given. The administrative processes were identical at both waves.

## RESULTS

### Preliminary analysis

**Attrition analysis.** We used multivariate ANOVA and chi-square tests to compare the continuous and categorical variables at W1 between the complete group and the attrition group, respectively. Our results indicated that the two groups did not significantly differ in PI, PV, IGD, student age, student gender, or parents' educational level. These findings suggested that the results were not supposed to be biased by a small number of dropouts.

**Descriptive statistics and bivariate correlations.** As summarized in Table 1, participants reported medium levels of PI, low levels of PV, low-to-medium levels of CFC-I, medium-to-high levels of CFC-F, and low levels of IGD. Besides, the prevalence rate of IGD in this study was 10.81% and 9.45% at W1 and W2, respectively. Of note, although the mean score of PV was low, results of frequency statistics found that around 87.4% students reported they had ever been bullied in the past month.

Regarding correlations, W1 PI was positively related to W2 CFC-F and negatively related to W1/W2 IGD. W1 PV was positively associated with W2 CFC-I and W1/W2 IGD.

W2 CFC-F and CFC-I was negatively and positively related to W2 IGD, respectively. Of note, the effect sizes for these coefficients ranged from small to small-to-medium, according to Cohen's standard (1992).

### Primary analysis

The model fit was good,  $\chi^2(10)=24.659$ ,  $RMSEA=0.058$ ,  $CFI=0.942$ ,  $SRMR=0.044$ . As shown in Table 2, the total model explained 36% variance of W2 IGD. After controlling for W1 IGD and demographic variables, none of W1 PI, W1 PV, or their interaction effect was significantly related to W2 IGD. In addition, the correlation between CFC-I and CFC-F was not significant ( $B=0.047$ ,  $SE=0.050$ ,  $P=0.344$ ).

Neither W1 PI nor W1 PV was predictive of W2 CFC-I, but their interaction effect on W2 CFC-I was significant. Furthermore, W1 PI was significantly related to W2 CFC-F, but W1 PV was not. Their interaction effect on W2 CFC-F was also significant. As expected, W2 CFC-I and CFC-F was positively and negatively related to W2 IGD, respectively.

Given the significant interaction effects, we probed their respective simple slopes. For W2 CFC-I, the results showed that the relation between W1 PI and W2 CFC-I was significant for participants who reported higher levels of PV but not for those who reported lower levels of PV (Fig. 2). For W2 CFC-F, results indicated that the relation between W1 PI and W2 CFC-F was significant for those who reported lower levels of PV but not for those who reported higher levels of PV (Fig. 3).

Finally, as summarized in Table 3, the mediation effect of CFC-I in the association between W1 PI and W2 IGD was not significant when PV was low, but it was significant when PV was high. By contrast, the mediation effect of CFC-F was significant when PV was low but insignificant when PV was high.

Table 1. Means, standard deviations, and correlations of the study variables

|                                | 1                   | 2                    | 3                   | 4                   | 5                   | 6                  | 7                  | 8                    | 9                   | 10   |
|--------------------------------|---------------------|----------------------|---------------------|---------------------|---------------------|--------------------|--------------------|----------------------|---------------------|------|
| <i>Covariates</i>              |                     |                      |                     |                     |                     |                    |                    |                      |                     |      |
| 1. Student age at W1           | –                   |                      |                     |                     |                     |                    |                    |                      |                     |      |
| 2. Student gender              | –0.01               | –                    |                     |                     |                     |                    |                    |                      |                     |      |
| 3. Father's level of education | –0.07               | 0.03                 | –                   |                     |                     |                    |                    |                      |                     |      |
| 4. Mother's level of education | –0.07               | 0.02                 | 0.44 <sup>***</sup> | –                   |                     |                    |                    |                      |                     |      |
| <i>Key variables</i>           |                     |                      |                     |                     |                     |                    |                    |                      |                     |      |
| 5. W1 PI                       | –0.16 <sup>**</sup> | –0.04                | 0.19 <sup>***</sup> | 0.26 <sup>***</sup> | –                   |                    |                    |                      |                     |      |
| 6. W1 PV                       | –0.02               | –0.08                | 0.10 <sup>*</sup>   | –0.03               | –0.05               | –                  |                    |                      |                     |      |
| 7. W2 CFC-I                    | –0.03               | –0.08                | –0.01               | 0.03                | –0.07               | 0.13 <sup>**</sup> | –                  |                      |                     |      |
| 8. W2 CFC-F                    | 0.02                | 0.08                 | 0.01                | 0.00                | 0.21 <sup>***</sup> | 0.03               | 0.07               | –                    |                     |      |
| 9. W2 IGD                      | 0.11 <sup>*</sup>   | –0.19 <sup>***</sup> | 0.01                | –0.07               | –0.15 <sup>**</sup> | 0.15 <sup>**</sup> | 0.17 <sup>**</sup> | –0.20 <sup>***</sup> | –                   |      |
| 10. W1 IGD                     | 0.04                | –0.32 <sup>***</sup> | –0.04               | –0.11 <sup>*</sup>  | –0.16 <sup>**</sup> | 0.16 <sup>**</sup> | 0.13 <sup>**</sup> | –0.18 <sup>***</sup> | 0.59 <sup>***</sup> | –    |
| <i>M</i>                       | 14.45               | 50.68 <sup>a</sup>   | –                   | –                   | 2.20                | 0.65               | 3.85               | 4.74                 | 1.45                | 1.79 |
| <i>SD</i>                      | 1.55                | –                    | –                   | –                   | 0.70                | 0.52               | 0.93               | 0.92                 | 1.96                | 1.99 |

Note: Sample size ranged from 434 to 444 due to missing data. \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ . Student gender: 1 = males, 2 = females; education: 1 = primary school, 2 = middle school, 3 = undergraduate, 4 = master or above. <sup>a</sup> The percentage of female adolescents. PI = parental involvement, PV = peer victimization, CFC-I = consideration of future consequences-immediate, CFC-F = consideration of future consequences-future, IGD = Internet gaming disorder. W1 = Wave 1, W2 = Wave 2.



Table 2. Summary of the moderated mediation model

|                             | W2 CFC-I ( $R^2 = 4.0\%$ ) |             |              | W2 CFC-F ( $R^2 = 7.0\%$ ) |             |                | W2 IGD ( $R^2 = 36.0\%$ ) |             |                |
|-----------------------------|----------------------------|-------------|--------------|----------------------------|-------------|----------------|---------------------------|-------------|----------------|
|                             | B                          | SE          | P            | B                          | SE          | P              | B                         | SE          | P              |
| <i>Covariates</i>           |                            |             |              |                            |             |                |                           |             |                |
| Student age at W1           |                            |             |              |                            |             |                | <b>0.11</b>               | <b>0.05</b> | <b>0.016</b>   |
| Student gender              |                            |             |              |                            |             |                | 0.03                      | 0.16        | 0.862          |
| Father’s level of education |                            |             |              |                            |             |                | 0.16                      | 0.17        | 0.343          |
| Mother’s level of education |                            |             |              |                            |             |                | −0.09                     | 0.14        | 0.532          |
| W1 IGD                      |                            |             |              |                            |             |                | <b>0.53</b>               | <b>0.06</b> | < <b>0.001</b> |
| <i>Study variables</i>      |                            |             |              |                            |             |                |                           |             |                |
| W1 PI                       | −0.08                      | 0.07        | 0.211        | <b>0.28</b>                | <b>0.06</b> | < <b>0.001</b> | −0.04                     | 0.11        | 0.701          |
| W1 PV                       | 0.18                       | 0.09        | 0.055        | 0.01                       | 0.09        | 0.885          | 0.20                      | 0.16        | 0.222          |
| W1 PI × W1 PV               | <b>−0.28</b>               | <b>0.12</b> | <b>0.019</b> | <b>−0.31</b>               | <b>0.13</b> | <b>0.015</b>   | 0.08                      | 0.21        | 0.719          |
| W2 CFC-I                    |                            |             |              |                            |             |                | <b>0.22</b>               | <b>0.09</b> | <b>0.013</b>   |
| W2 CFC-F                    |                            |             |              |                            |             |                | <b>−0.24</b>              | <b>0.09</b> | <b>0.009</b>   |

Note: Student gender: 1 = males, 2 = females; education: 1 = primary school, 2 = middle school, 3 = undergraduate, 4 = master or above; PI = parental involvement, PV = peer victimization, CFC-I = consideration of future consequences-immediate, CFC-F = consideration of future consequences-future, IGD = internet gaming disorder. W1 = Wave 1, W2 = Wave 2. The significant results are bolded.

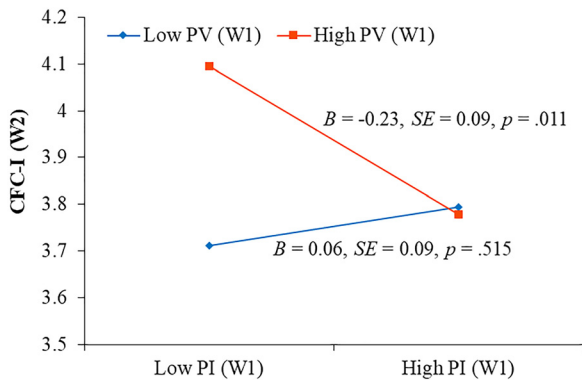


Fig. 2. The Relation between Parental Involvement and Consideration of Future Consequences-Immediate by High and Low Levels of Peer Victimization

Note: PI = Parent involvement, CFC-I = consideration of future consequences-immediate, PV = peer victimization. W1 = Wave 1, W2 = Wave 2.

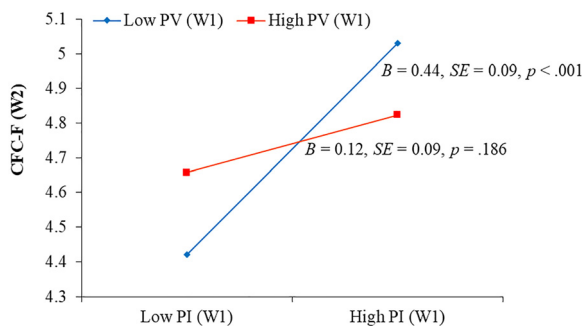


Fig. 3. The Relation between Parental Involvement and Consideration of Future Consequences-Future by High and Low Levels of Peer Victimization

Note: PI = parent involvement, CFC-F = consideration of future consequences-future, PV = peer victimization. W1 = Wave 1, W2 = Wave 2.

Table 3. Conditional indirect effects of W1 parent involvement on W2 internet gaming disorder via W2 consideration of future consequences-future/consideration of future consequences-immediate by W1 peer victimization

| Levels of W1 peer victimization | Indirect effect | SE          | 95% Bootstrapped CI     |
|---------------------------------|-----------------|-------------|-------------------------|
| <i>W2 CFC-I as mediator</i>     |                 |             |                         |
| Low (−1 SD)                     | 0.01            | 0.02        | [−0.021, 0.075]         |
| High (+1 SD)                    | <b>−0.05</b>    | <b>0.03</b> | <b>[−0.129, −0.008]</b> |
| Diff = High-Low                 | <b>−0.06</b>    | <b>0.04</b> | <b>[−0.163, −0.006]</b> |
| <i>W2 CFC-F as mediator</i>     |                 |             |                         |
| Low (−1 SD)                     | <b>−0.10</b>    | <b>0.04</b> | <b>[−0.213, −0.034]</b> |
| High (+1 SD)                    | −0.03           | 0.03        | [−0.097, 0.003]         |
| Diff = High-Low                 | <b>0.08</b>     | <b>0.04</b> | <b>[0.010, 0.181]</b>   |

Note: CFC-I = consideration of future consequences-immediate; CFC-F = consideration of future consequences-future. W1 = Wave 1, W2 = Wave 2. The significant results are bolded.

## DISCUSSION

IGD is a concerning issue that hinders positive youth development. Little research has specifically examined the association between PI and adolescent IGD as well as the mediating and moderating mechanisms. This study filled the gaps by examining the longitudinal association between PI and IGD and investigating CFC as a mediator and PV as a moderator. Descriptive statistics revealed the prevalence rate of adolescent IGD was about 10%. Besides, findings of path analysis indicated that PI alleviated adolescent IGD via preventing adolescents who had higher levels of PV from developing a tendency of CFC-I and via promoting adolescents who had lower levels of PV to develop a tendency of CFC-F, which largely supported our hypotheses. Taken together, these findings contribute to the bigger picture of



how adolescent IGD develops in relation to different ecological contexts and individuals' future orientation.

While studies have well documented the role of parenting in adolescent IGD (Chen et al., 2020; Cuong et al., 2021; Su et al., 2018; Zhu & Chen, 2021; for a review, see Paulus et al., 2018), very few studies focused on PI (Nielsen et al., 2020). The current research contributed to this limited knowledge. In this study, we did not find that PI was directly predictive of IGD, which is not consistent with the existing research (Koc et al., 2020). The inconsistencies are probably due to methodological differences. Specifically, prior studies are predominantly cross-sectional in nature and do not control for baseline levels of IGD. In this study, we controlled for W1 IGD which explained considerable variance of W2 IGD. Despite the insignificant direct association, our findings suggested that PI may play a role in IGD in a nuanced manner, which is discussed below.

Supporting the buffering and susceptibility model of CFC (Joireman et al., 2012; Joireman & King, 2016) and relevant findings (Kim, Hong, et al., 2017; Labár & Tepordei, 2019; Przepiorka & Blachnio, 2016), our results found that participants high in CFC-I and CFC-F were more and less prone to IGD, respectively. Going above and beyond, we continued to examine the mediation effect of CFC and its boundary conditions. As expected, our findings revealed that the mediation effects of CFC were conditional on PV. These nuanced findings manifest in two aspects.

First, strong PI was related to lower levels of CFC-I only for adolescents who had higher levels of PV but not for those who had lower levels of PV. According to the fast life history theory (Del Giudice et al., 2016; Dunkel et al., 2013), adolescents living in adverse environments such as being exposed to PV are likely to use immediate gratifying strategies to obtain resources, including interpersonal resources, to survive and thrive (Del Giudice et al., 2016; Dunkel et al., 2013). Nevertheless, the perspectives of the risk and resilience model suggest that external assets (e.g., positive parenting) may protect people's psychosocial functioning by helping them to navigate environmental risks (Masten, 2001). We speculate that such protective effect should occur when the risks are present, but it may not necessarily occur when the risks are absent. As such, PI helps prevent adolescents who have encountered high levels of PV from developing the here-and-now orientation, which in turn alleviates their subsequent IGD to escape from the real-world peer problems. For adolescents experiencing low levels of PV, there may be much fewer risks that drive them to develop an immediate gratifying tendency of playing internet games, and thus the protective effect of PI does not manifest.

Second, strong PI was only related to higher CFC-F for adolescents who reported lower levels PV rather than for those who reported higher levels of PV. This finding concurs with Riina's (2021) study which found that the role of PI was more strongly related to higher future orientation when the environments are less risky. Likewise, the findings also support the life history theory that adolescents living in a safe, resourceful environment are more prone to consider long-term goals and consequences (Del Giudice et al., 2016;

Dunkel et al., 2013). These perspectives, coupled with the current results, suggest that a *well-rounded* facilitative environment is the foundation for adolescents to develop positive beliefs about the future, through which they restrain internet gaming behavior and are less prone to IGD.

Starting from the uses and gratification theory (Bulduklu, 2019; Katz et al., 1974), we proposed that strong PI would be negatively related to IGD. However, the theory did not explicitly articulate the underlying mechanisms. Our findings contribute to this theory by incorporating CFC-I and CFC-F as underlying mechanisms in the association between (un)satisfied psychological needs and uses of internet gaming for psychological gratification. Besides, the socio-ecological framework of future orientation (Johnson et al., 2014) proposes that functional and facilitative ecological systems are critical factors that nurture adolescents to develop a positive sense toward the future. However, this framework does not explicitly talk about the joint effects between different ecological system on future orientation. The current results dovetail with prior research findings (e.g., Laghi et al., 2009) to suggest that different ecological systems *do* work together to foster adolescents' CFC.

While this study examined the effect of PI on IGD, it would be certainly promising for future research to investigate whether there is a reciprocal association. According to the developmental-contextual perspective (Schoon, Sacker, & Bartley, 2003), contextual factors such as family and peer factors affect an individual's developmental outcomes such as IGD (i.e., causation effect). The perspective also posits that an individual's developmental outcomes elicit differential responses from the context that further consolidate the outcomes (i.e., health selection effect). Prior study used a two-wave design to examine parent-child discussion and IGD and social media disorder in Dutch adolescents (Koning, Peeters, Finkenauer, & Van Den Eijnden, 2018). It found that while the frequency of parent-child communication was related to later IGD, preceding IGD also elicited less quality communication between parents and adolescents subsequently. As such, future research may examine the extent to which preceding PI mitigates later IGD and then consolidates subsequent PI, and the extent to which preceding IGD elicits less PI and then reinforces later IGD.

Our findings suggest a holistic approach to mitigating adolescent IGD. Specifically, stakeholders (e.g., parents, schools, and policymakers) should not only build facilitative environments by enhancing PI and reducing PV, but they also need to decrease CFC-I and nurture CFC-F in young people. Of note, peers become a more important source than parents in affecting adolescents' daily lives although parents are still crucial for big decisions and comfort when needed (Buist, Deković, Meeus, & van Aken, 2004; Erath, Pettit, & Troop-Gordon, 2021). The significant interaction between PI and PV on adolescent CFC suggests the importance of facilitating both the family and peer systems simultaneously to strengthen adolescents' positive future orientation. Dishion, Mun, Ha, and Tein (2019) considered that targeting the "mesosystem" to develop tailored prevention and



intervention would be more helpful in addressing adolescents' problem behavior than focusing on an individual system alone. Besides, as the effects of PI and CFC on IGD are conditional on the peer system, this suggests that adolescents who are excessively exposed to PV are at more risks and in dire need of support. Taking PV into account is crucial, as our study revealed a high prevalence rate of PV in the past month although the mean score was low. In China, school bullying is a main source of PV; and as such, schools should establish a safe and structured environment and strengthen students' social emotional skills so that they can deal with bullying and victimization more effectively (Xu, Ren, Li, Wang, & Wang, 2020).

This study has several limitations. First, although we adopted a two-wave longitudinal design and controlled for W1 IGD, the study is correlational in nature and no firm causality could be deduced. Second, as the sample was recruited in one city with convenience sampling, the generalizability of findings is limited. Future research needs to enhance the representativeness of the sample. Third, only self-report measures were used, although studies suggest that using self-report measures to assess PI (from the child's perspective), PV (from the victim's perspective), and IGD (from the actor's perspective) yield important and accurate information (Card & Hodges, 2008; Ko et al., 2005; Wu et al., 2018). Nevertheless, future research may use multi-informant to triangulate the study variables to reduce common method bias. Fourth, the measure of PV did not explicitly distinguish online or offline victimization. Given the difference in the nature and severity between online and offline PV, future studies may need to examine the role of each type of victimization in adolescent IGD separately. Fifth, readers should interpret the findings with caution as the Cronbach alpha coefficient for PV was less than 0.70, although it was still acceptable ( $>0.60$ ) and comparable to prior studies. Sixth, our study did not distinguish fathers' or mothers' PI. As fathers and mothers play a different role in adolescents' problem behavior in the Chinese context (Sun, Li, Oktaufik, & Vazsonyi, 2021), it would be promising to re-visit this issue by separating paternal and maternal PI. Finally, we used the questionnaire adapted from Young's (1998) Internet Addiction Scale to measure IGD in this study. Although this scale has been often used to measure IGD (for reviews, see Feng et al., 2017; Kaptsis, King, Delfabbro, & Gradisar, 2016), it is not an updated instrument and may not capture all the diagnostic criteria as set out by DSM-5. Hence, future research needs to use more updated measures to assess IGD comprehensively.

To conclude, this research aims to understand the role of PI in adolescent IGD and the underlying mechanisms. Our results suggest that adequate PI is associated with less IGD through preventing adolescents with higher levels of PV from developing an immediate gratifying tendency and through promoting adolescents with lower levels of PV to develop a positive future orientation. These findings suggest that both facilitative ecological systems and personal strength contribute to the mitigation of adolescent IGD.

**Funding sources:** Kai Dou was supported by National Natural Science Foundation of China (32071067), 13th Five-Year Plan of Philosophy and Social Science of Guangzhou (2020GZYB92), and Guangzhou Education Scientific Research Project (202113700). Jian-Bin Li was supported by the FEHD's Internationalization & Exchange Research Scheme of the Education University of Hong Kong. Correspondence concerning this article should be addressed to Jian-Bin Li, Department of Early Childhood Education, The Education University of Hong Kong, 10 Lo Ping Road, Tai Po, New Territory, Hong Kong Special Administrative Region, People's Republic of China.

**Authors' contribution:** K.D.: conceptualization, methodology, resources, funding acquisition. X-K.F.: writing – review & editing, preparation. L-X.W.: writing – review & editing, data analysis. J-B.L.: methodology, writing – review & editing, funding acquisition, supervision.

**Conflict of interest:** We have no conflicts of interest to disclose.

## REFERENCES

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Buist, K. L., Deković, M., Meeus, W., & van Aken, M. A. (2004). The reciprocal relationship between early adolescent attachment and internalizing and externalizing problem behaviour. *Journal of Adolescence*, 27(3), 251–266. <https://doi.org/10.1016/j.adolescence.2003.11.012>.
- Bulduklu, Y. (2019). Mobile games on the basis of uses and gratifications approach: A comparison of the mobile game habits of university and high school students. *Convergence-the International Journal of Research into New Media Technologies*, 25(5–6), 901–917. <https://doi.org/10.1177/1354856517748159>.
- Cacioppo, M., Barni, D., Correale, C., Mangialavori, S., Danioni, F., & Gori, A. (2019). Do attachment styles and family functioning predict adolescents' problematic internet use? A relative weight analysis. *Journal of Child and Family Studies*, 28(5), 1263–1271. <https://doi.org/10.1007/s10826-019-01357-0>.
- Card, N. A., & Hodges, E. V. E. (2008). Peer victimization among schoolchildren: Correlations, causes, consequences, and considerations in assessment and intervention. *School Psychology Quarterly*, 23(4), 451–461. <https://doi.org/10.1037/a0012769>.
- Chen, I. H., Lee, Z. H., Dong, X. Y., Gamble, J. H., & Feng, H. W. (2020). The influence of parenting style and time management tendency on Internet gaming disorder among adolescents. *International Journal of Environmental Research and Public Health*, 17(23), Article 9120. <https://doi.org/10.3390/ijerph17239120>.





- Chittaro, L., & Vianello, A. (2013). Time perspective as a predictor of problematic Internet use: A study of Facebook users. *Personality and Individual Differences*, 55(8), 989–993. <https://doi.org/10.1016/j.paid.2013.08.007>.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155–159. <https://doi.org/10.1037/0033-2909.112.1.155>.
- Costa, S., Cuzzocrea, F., Gugliandolo, M. C., & Larcán, R. (2016). Associations between parental psychological control and autonomy support, and psychological outcomes in adolescents: The mediating role of need satisfaction and need frustration. *Child Indicators Research*, 9(4), 1059–1076. <https://doi.org/10.1007/s12187-015-9353-z>.
- Costa, S., Sireno, S., Larcán, R., & Cuzzocrea, F. (2019). The six dimensions of parenting and adolescent psychological adjustment: The mediating role of psychological needs. *Scandinavian Journal of Psychology*, 60(2), 128–137. <https://doi.org/10.1111/sjop.12507>.
- Cuong, V. M., Assanangkornchai, S., Wichaidit, W., Minh Hanh, V. T., & My Hanh, H. T. (2021). Associations between gaming disorder, parent-child relationship, parental supervision, and discipline styles: Findings from a school-based survey during the COVID-19 pandemic in Vietnam. *Journal of Behavioral Addictions*, 10(3), 722–730. <https://doi.org/10.1556/2006.2021.00064>.
- Davidson, T. M., & Cardemil, E. V. (2009). Parent-child communication and parental involvement in Latino adolescents. *The Journal of Early Adolescence*, 29(1), 99–121. <https://doi.org/10.1177/0272431608324480>.
- Del Giudice, M., Gangestad, S. W., & Kaplan, H. S. (2016). Life history theory and evolutionary psychology. In D. M. Buss (Ed.), *The handbook of evolutionary psychology: Foundations* (pp. 88–114). John Wiley & Sons, Inc.
- Dishion, T. J., Mun, C. J., Ha, T., & Tein, J. Y. (2019). Observed family and friendship dynamics in adolescence: A latent profile approach to identifying “mesosystem” adaptation for intervention tailoring. *Prevention Science*, 20(1), 41–55. <https://doi.org/10.1007/s11121-018-0927-0>.
- Duckworth, A. L., & Steinberg, L. (2015). Unpacking self-control. *Child Development Perspectives*, 9(1), 32–37. <https://doi.org/10.1111/cdep.12107>.
- Dunkel, C. S., Mathes, E., & Beaver, K. M. (2013). Life history theory and the general theory of crime: Life expectancy effects on low self-control and criminal intent. *Journal of Social, Evolutionary, and Cultural Psychology*, 7(1), 12–23. <https://doi.org/10.1037/h0099177>.
- Durkee, T., Kaess, M., Carli, V., Parzer, P., Wasserman, C., Floderus, B., ... Wasserman, D. (2012). Prevalence of pathological internet use among adolescents in Europe: Demographic and social factors. *Addiction*, 107(12), 2210–2222. <https://doi.org/10.1111/j.1360-0443.2012.03946.x>.
- Erath, S. A., Flanagan, K. S., & Bierman, K. L. (2008). Early adolescent school adjustment: Associations with friendship and peer victimization. *Social Development*, 17(4), 853–870. <https://doi.org/10.1111/j.1467-9507.2008.00458.x>.
- Erath, S. A., Pettit, G. S., & Troop-Gordon, W. (2021). Direct and compensatory parental responses to peer victimization. *Journal of Early Adolescence*, 41(1), 197–217, Article 0272431620940386. <https://doi.org/10.1177/0272431620940386>.
- Eugene, D. R., Du, X., & Kim, Y. K. (2021). School climate and peer victimization among adolescents: A moderated mediation model of school connectedness and parental involvement. *Children and Youth Services Review*, 121, 105854. <https://doi.org/10.1016/j.childyouth.2020.105854>.
- Feng, W., Ramo, D., Chan, S., & Bourgeois, J. (2017). Internet gaming disorder: Trends in prevalence 1998–2016. *Addictive Behaviors*, 75, 17–24. <https://doi.org/10.1016/j.addbeh.2017.06.010>.
- Fumero, A., Marrero, R. J., Bethencourt, J. M., & Penate, W. (2020). Risk factors of internet gaming disorder symptoms in Spanish adolescents. *Computers in Human Behavior*, 111, Article 106416. <https://doi.org/10.1016/j.chb.2020.106416>.
- Gentile, D. A., Bailey, K., Bavelier, D., Brockmyer, J. F., Cash, H., Coyne, S. M., ... Young, K. (2017). Internet gaming disorder in children and adolescents. *Pediatrics*, 140(Supplement 2), S81–S85. <https://doi.org/10.1542/peds.2016-1758H>.
- Harris, M. J. (Ed.). (2009). *Bullying, rejection, & peer victimization: A social cognitive neuroscience perspective*. Springer Publishing Company.
- Johnson, S. R. L., Blum, R. W., & Cheng, T. L. (2014). Future orientation: A construct with implications for adolescent health and wellbeing. *International Journal of Adolescents and Medical Health*, 26, 459–468. <https://doi.org/10.1515/ijamh-2013-0333>.
- Joireman, J., Balliet, D., Sprott, D., Spangenberg, E., & Schultz, J. (2008). Consideration of future consequences, ego-depletion, and self-control: Support for distinguishing between CFC-Immediate and CFC-Future sub-scales. *Personality and Individual Differences*, 45(1), 15–21. <https://doi.org/10.1016/j.paid.2008.02.011>.
- Joireman, J., & King, S. (2016). Individual differences in the consideration of future and (more) immediate consequences: A review and directions for future research. *Social and Personality Psychology Compass*, 10(5), 313–326. <https://doi.org/10.1111/spc3.12252>.
- Joireman, J., Shaffer, M. J., Balliet, D., & Strathman, A. (2012). Promotion orientation explains why future-oriented people exercise and eat healthy: Evidence from the two-factor consideration of future consequences-14 scale. *Personality & Social Psychology Bulletin*, 38(10), 1272–1287. <https://doi.org/10.1177/0146167212449362>.
- Kaptsis, D., King, D. L., Delfabbro, P. H., & Gradisar, M. (2016). Withdrawal symptoms in internet gaming disorder: A systematic review. *Clinical Psychology Review*, 43, 58–66. <https://doi.org/10.1016/j.cpr.2015.11.006>.
- Katz, E., Blumler, J. G., & Gurevitch, M. (1974). Utilization of mass communication by the individual. In Blumler, J. G. & Katz, E. (Eds.). *The uses of mass communications: Current perspectives on gratifications research* (pp. 19–32). Beverly Hills, CA: Sage.
- Kim, J., Hong, H., Lee, J., & Hyun, M. H. (2017). Effects of time perspective and self-control on procrastination and Internet addiction. *Journal of Behavioral Addictions*, 6(2), 229–236. <https://doi.org/10.1556/2006.6.2017.017>.
- Kim, Y. J., Lim, J. A., Lee, J. Y., Oh, S., Kim, S. N., Kim, D. J., ... Choi, J. S. (2017). Impulsivity and compulsivity in internet gaming disorder: A comparison with obsessive-compulsive disorder and alcohol use disorder. *Journal of Behavioral Addictions*, 6, 545–553. <https://doi.org/10.1556/2006.6.2017.069>.



- Ko, C. H., Yen, C. F., Yen, C. N., Yen, J. Y., Chen, C. C., & Chen, S. H. (2005). Screening for Internet addiction: An empirical study on cut-off points for the Chen Internet Addiction Scale. *The Kaohsiung Journal of Medical Sciences*, 21(12), 545–551. [https://doi.org/10.1016/S1607-551X\(09\)70206-2](https://doi.org/10.1016/S1607-551X(09)70206-2).
- Koc, E. B., Ozer, G. K., Mutlu, C., Onal, B. S., Ciftci, A., & Ercan, O. (2020). Assessment of attitude of parents towards adolescents with Internet gaming disorder. *Pediatrics International*, 62(7), 848–856. <https://doi.org/10.1111/ped.14238>.
- Koning, I. M., Peeters, M., Finkenauer, C., & Van Den Eijnden, R. J. (2018). Bidirectional effects of Internet-specific parenting practices and compulsive social media and Internet game use. *Journal of Behavioral Addictions*, 7(3), 624–632. <https://doi.org/10.1556/2006.7.2018.68>.
- Kuss, D. J., Griffiths, M. D., & Pontes, H. M. (2017). Chaos and confusion in DSM-5 diagnosis of Internet Gaming Disorder: Issues, concerns, and recommendations for clarity in the field. *Journal of Behavioral Addictions*, 6, 103–109. <https://doi.org/10.1556/2006.5.2016.062>.
- Labăr, A. V., & Tepordei, A. M. (2019). The interplay between time perspective, internet use and smart phone in class multitasking: A mediation analysis. *Computers in Human Behavior*, 93, 33–39. <https://doi.org/10.1016/j.chb.2018.11.050>.
- Laghi, F., D'Alessio, M., Pallini, S., & Baiocco, R. (2009). Attachment representations and time perspective in adolescence. *Social Indicators Research*, 90(2), 181–194. <https://doi.org/10.1007/s11205-008-9249-0>.
- Li, X., Li, D. P., & Newman, J. (2013). Parental behavioral and psychological control and problematic Internet use among Chinese adolescents: The mediating role of self-control. *Cyberpsychology Behavior and Social Networking*, 16(6), 442–447. <https://doi.org/10.1089/cyber.2012.0293>.
- Li, J. B., Willems, Y. E., Stok, F. M., Dekovic, M., Bartels, M., & Finkenauer, C. (2019). Parenting and self-control across early to late adolescence: A three-level meta-analysis. *Perspectives on Psychological Science*, 14(6), 967–1005. <https://doi.org/10.1177/1745691619863046>.
- Liang, Q., Yu, C., Xing, Q., Liu, Q., & Chen, P. (2021). The influence of parental knowledge and basic psychological needs satisfaction on peer victimization and Internet gaming disorder among Chinese adolescents: A mediated moderation model. *International Journal of Environmental Research and Public Health*, 18(5), Article 2397. <https://doi.org/10.3390/ijerph18052397>.
- Liu, Q. X., Fang, X. Y., Wan, J. J., & Zhou, Z. K. (2016). Need satisfaction and adolescent pathological internet use: Comparison of satisfaction perceived online and offline. *Computers in Human Behavior*, 55, 695–700. <https://doi.org/10.1016/j.chb.2015.09.048>.
- Liu, Q. Q., Yang, X. J., Hu, Y. T., & Zhang, C. Y. (2020). Peer victimization, self-compassion, gender and adolescent mobile phone addiction: Unique and interactive effects. *Children and Youth Services Review*, 118, 105397. <https://doi.org/10.1016/j.childyouth.2020.105397>.
- Lukavská, K. (2012). Time perspective as a predictor of massive multiplayer online role-playing game playing. *Cyberpsychology Behavior and Social Networking*, 15(1), 50–54. <https://doi.org/10.1089/cyber.2011.0171>.
- Lukavská, K. (2018). The immediate and long-term effects of time perspective on Internet gaming disorder. *Journal of Behavioral Addictions*, 7(1), 44–51. <https://doi.org/10.1556/2006.6.2017.089>.
- Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, 56(3), 227–238. <https://doi.org/10.1037/0003-066X.56.3.227>.
- Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide (version 8)*. Los Angeles, CA: Muthén & Muthén.
- Nicholson, J. V., Chen, Y. F., & Huang, C. C. (2018). Children's exposure to intimate partner violence and peer bullying victimization. *Children and Youth Services Review*, 91, 439–446. <https://doi.org/10.1016/j.childyouth.2018.06.034>.
- 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>.
- Paulus, F. W., Ohmann, S., Von Gontard, A., & Popow, C. (2018). Internet gaming disorder in children and adolescents: A systematic review. *Developmental Medicine and Child Neurology*, 60(7), 645–659. <https://doi.org/10.1111/dmcn.13754>.
- Peng, X., Cui, F., Wang, T., & Jiao, C. (2017). Unconscious processing of facial expressions in individuals with internet gaming disorder. *Frontiers in Psychology*, 8, 1059. <https://doi.org/10.3389/fpsyg.2017.01059>.
- Przepiorka, A., & Blachnio, A. (2016). Time perspective in Internet and Facebook addiction. *Computers in Human Behavior*, 60, 13–18. <https://doi.org/10.1016/j.chb.2016.02.045>.
- Reijntjes, A., Kamphuis, J. H., Prinzie, P., Boelen, P. A., Van der Schoot, M., & Telch, M. J. (2011). Prospective linkages between peer victimization and externalizing problems in children: A meta-analysis. *Aggressive Behavior*, 37(3), 215–222. <https://doi.org/10.1002/ab.20374>.
- Reijntjes, A., Kamphuis, J. H., Prinzie, P., & Telch, M. J. (2010). Peer victimization and internalizing problems in children: A meta-analysis of longitudinal studies. *Child Abuse & Neglect*, 34(4), 244–252. <https://doi.org/10.1016/j.chiabu.2009.07.009>.
- Riina, E. M. (2021). Associations between parenting qualities, neighborhood disadvantage, and future orientations among urban adolescents. *Journal of Child and Family Studies*, 30(12), 3029–3039. <https://doi.org/10.1007/s10826-021-02103-1>.
- Schoon, I., Sacker, A., & Bartley, M. (2003). Socio-economic adversity and psychosocial adjustment: A developmental-contextual perspective. *Social Science & Medicine*, 57(6), 1001–1015. [https://doi.org/10.1016/S0277-9536\(02\)00475-6](https://doi.org/10.1016/S0277-9536(02)00475-6).
- Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, 52(1), 83–110. <https://doi.org/10.1146/annurev.psych.52.1.83>.
- Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology*, 66(4), 742–752. <https://doi.org/10.1037/0022-3514.66.4.742>.
- Su, B., Yu, C., Zhang, W., Su, Q., Zhu, J., & Jiang, Y. (2018). Father-child longitudinal relationship: Parental monitoring and Internet gaming disorder in Chinese adolescents. *Frontiers in Psychology*, 9, Article 95. <https://doi.org/10.3389/fpsyg.2018.00095>.



- Sun, Y., Li, J. B., Oktaufik, M. P. M., & Vazsonyi, A. T. (2021). Parental attachment and externalizing behaviors among Chinese adolescents: The mediating role of self-control. *Journal of Child and Family Studies*, 31(4), 923–933. <https://doi.org/10.1007/s10826-021-02071-6>.
- Van Geel, M., Vedder, P., & Tanilon, J. (2014). Relationship between peer victimization, cyberbullying, and suicide in children and adolescents: A meta-analysis. *JAMA Pediatrics*, 168(5), 435–442. <https://doi.org/10.1001/jamapediatrics.2013.4143>.
- Vollmer, C., Randler, C., Horzum, M. B., & Ayas, T. (2014). Computer game addiction in adolescents and its relationship to chronotype and personality. *Sage Open*, 4, 1–9. <https://doi.org/10.1177/2158244013518054>.
- Wang, L. X., Dou, K., Li, J. B., Zhang, M. C., & Guan, J. Y. (2021). The association between interparental conflict and problematic internet use among Chinese adolescents: Testing a moderated mediation model. *Computers in Human Behavior*, 122, Article 106832. <https://doi.org/10.1016/j.chb.2021.106832>.
- Wang, H. X., Geng, J. Y., Liu, K., Wei, X. Y., Wang, J., & Lei, L. (2021). Future time perspective and self-control mediate the links between parental autonomy support and adolescents' digital citizenship behavior. *Youth & Society*, 20, Article 0044118x211020778. <https://doi.org/10.1177/0044118x211020778>.
- Wilder, S. (2014). Effects of parental involvement on academic achievement: A meta-synthesis. *Educational Review*, 66(3), 377–397. <https://doi.org/10.1080/00131911.2013.780009>.
- World Health Organization. (2020). Addictive behaviours: Gaming disorder. <https://www.who.int/news-room/questions-and-answers/item/addictive-behaviours-gaming-disorder> [Accessed 18 July 2022].
- Wu, X. C., Liu, C., Zou, S. Q., & Hou, F. (2018). Psychometric properties of the adolescent revision of parental involvement behavior questionnaire. *Chinese Journal of Clinical Psychology*, 26(4), 647–651. <https://doi.org/10.16128/j.cnki.1005-3611.2018.04.004>.
- Xu, S. Q., Ren, J., Li, F. F., Wang, L., & Wang, S. M. (2020). School bullying among vocational school students in China: Prevalence and associations with personal, relational, and school factors. *Journal of Interpersonal Violence*, 37(1–2), NP104–NP124. <https://doi.org/10.1177/0886260520907360>.
- Young, K. (1998). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology & Behavior*, 1(3), 237–244. <http://doi.org/10.1089/cpb.1998.1.237>.
- Yu, Y., Mo, P. K., Zhang, J., Li, J., & Lau, J. T. F. (2021). Impulsivity, self-control, interpersonal influences, and maladaptive cognitions as factors of internet gaming disorder among adolescents in China: Cross-sectional mediation study. *Journal of Medical Internet Research*, 23(10), Article e26810. <https://doi.org/10.2196/26810>.
- Zhai, B. Y., Li, D. P., Jia, J. C., Liu, Y. X., Sun, W. Q., & Wang, Y. H. (2019). Peer victimization and problematic internet use in adolescents: The mediating role of deviant peer affiliation and the moderating role of family functioning. *Addictive Behaviors*, 96, 43–49. <https://doi.org/10.1016/j.addbeh.2019.04.016>.
- Zhu, J., & Chen, Y. (2021). Developmental pathways from parental rejection to adolescent internet gaming disorder: A parallel process latent growth model. *Children and Youth Services Review*, 128, 106128. <https://doi.org/10.1016/j.childyouth.2021.106128>.
- Zhu, J. J., Zhang, W., Yu, C. F., & Bao, Z. Z. (2015). Early adolescent Internet game addiction in context: How parents, school, and peers impact youth. *Computers in Human Behavior*, 50, 159–168. <https://doi.org/10.1016/j.chb.2015.03.079>.

