



# Early adolescent Internet game addiction in context: How parents, school, and peers impact youth



Jianjun Zhu, Wei Zhang\*, Chengfu Yu, Zhenzhou Bao

School of Psychology & Center for Studies of Psychological Application, South China Normal University, PR China

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## ABSTRACT

The aim of this study was to identify the underlying mediating mechanisms between the parent–adolescent relationship and Internet game addiction (IGA). A sample of 833 adolescents initially in the 7th grade completed anonymous questionnaires regarding the parent–adolescent relationship, school connectedness, deviant peer affiliation, and IGA during a one year period. Structural equation models showed that both school connectedness and deviant peer affiliation fully mediated the association between the parent–adolescent relationship and adolescent IGA. School connectedness also significantly predicted deviant peer affiliation, forming a sequential mediation model. In general, the results indicated that a low quality parent–adolescent relationship predicted IGA by way of diminishing school connectedness and enhancing affiliations with deviant peers. The non-significant pathway from parent–adolescent relationship to adolescent IGA supports the idea that a distal parent–adolescent relationship still retains a substantial influence on the development of adolescents' IGA, but through the more important proximal variables of school connectedness and deviant peer affiliation. Identifying the processes by which the parent–adolescent relationship is associated with adolescents' IGA has important implications for developing an integrative framework of theory and prevention.

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## 1. Introduction

Since the first massive multiplayer online role-playing game was introduced in Korea, more and more adolescents enjoy Internet games for reasons such as the satisfaction of competence, autonomy and relaxation (Griffiths, 2003; Ryan, Rigby, & Przybylski, 2006). Appropriate Internet game use has been identified as advantageous for adolescents' growth and development. For instance, Subrahmanyam, Kraut, Greenfield, and Gross (2000) suggested that Internet game use enhances cognitive skills through emphasizing visual information processing. However, due to the increased amount of time that adolescents spend with Internet games, playing may become addictive for some persons when the activity becomes dysfunctional, harming the individual's social, occupational, family, school, and psychological functioning (Gentile et al., 2011; Kuss, 2013). Internet game addiction (IGA) is an important sub-type of Internet addiction (Young, Pistner,

O'MARA, & Buchanan, 1999). Because of the multiplicity of conceptualizations and measures, the estimated prevalence of IGA varies (0.2–10%) across cultures (Festl, Scharkow, & Quandt, 2013; Gentile, 2009; Hur, 2006). In June, 2013, Internet gaming addiction as one disorder was first brought into the appendix of the updated version of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5). Given the rapidly increasing attention given to IGA, efforts to explain why and how adolescents are profoundly involved in Internet games have become important research issues.

Researchers have begun to highlight developmental-ecological models (Bronfenbrenner, 1979) to identify protective and risk factors across contexts and mediational pathways leading to adolescent problematic behaviors (Catalano, Oesterle, Fleming, & Hawkins, 2004; Dodge et al., 2009). Multiple protective and risk factors for IGA have already been identified across multiple domains (e.g., parents, school and peer influence). In order to fully understand the determinants of adolescent IGA and emphasize the changing relative impact of ecological forces on adolescent development, we propose that family (i.e., parent–adolescent relationship), school (i.e., school connectedness) and peer (i.e., deviant peer affiliation) systems should be taken into consideration simultaneously. We used a short-term longitudinal design with multiple time points to examine whether school connectedness

*Abbreviations:* PAR, parent–adolescent relationship; IGA, internet game addiction; SC, school connectedness; DPA, deviant peer affiliation.

\* Corresponding author at: School of Psychology & Center for Studies of Psychological Application, South China Normal University, Guangzhou, Guangdong 510631, PR China. Tel.: +86 20 85216466.

E-mail address: [zhangwei@sclu.edu.cn](mailto:zhangwei@sclu.edu.cn) (W. Zhang).

and deviant peer affiliation function as mediators of the link between parent–adolescent relationship and adolescent IGA. Following are the relevant theoretical and empirical works that have led us to the current model.

### 1.1. Parent–adolescent relationship and IGA

The Self-Determination Theory (SDT), which holds that self-determination either facilitates or undermines adolescent intrinsic motivation and internalization, provides great insight into the link between the parent–adolescent relationship and adolescent IGA (Ryan & Deci, 2000). Przybylski, Rigby, and Ryan (2010) pointed out that the appeal of Internet games was based in their potential to satisfy basic psychological needs (i.e., competence, autonomy, and relatedness), and thus we can infer that a positive parent–adolescent relationship may protect against IGA under the SDT frame. An undesirable parent–adolescent relationship may frustrate basic psychological needs (Joussemet, Landry, & Koestner, 2008), and adolescents may seek satisfaction of those needs through Internet gaming (Ryan et al., 2006; Xu, Turel, & Yuan, 2012). Indeed, several studies have shown that a positive parent–adolescent relationship is a protective factor in that it is negatively associated with Internet addiction in general, not limited to IGA (Liu, Fang, Deng, & Zhang, 2012; Liu, Fang, Zhou, Zhang, & Deng, 2013; van Den Eijnden, Spijkerman, Vermulst, van Rooij, & Engels, 2010). More importantly, in a three year longitudinal study, van Den Eijnden et al. (2010) provided evidence that high quality parental communication about Internet use was an effective tool to prevent Internet addiction.

Although Koo and Kwon (2014) asserted that IGA and Internet addiction might be associated with similar psychological factors and they were distinctive expressions of the same underlying vulnerability, the link between the parent–adolescent relationship and IGA is not as clear as that between the parent–adolescent relationship and Internet addiction. Some studies have found a negative association between parental relationship and IGA (Kim, Son, Yang, Cho, & Lee, 2007; Kwon, Chung, & Lee, 2011). For instance, Kwon et al. (2011) documented that adolescents tended to increase the time spent on Internet games when they perceived a poor relationship with their parents, who were ignorant of their activities, oppressed them and showed hostility toward them. However, some studies also acknowledged that influence from parents might not be an significant correlate of IGA (Rehbein & Baier, 2013; Willoughby, 2008). Moreover, a meta-analysis exploring influences on IGA in Korea found that the weighted average correlation of IGA and the parental relationship was lower than correlations involving school and peer factors (Koo & Kwon, 2014). Given that the predictive value of family effect on IGA has been found to be relatively small (Kweon & Park, 2012; Kwon et al., 2011; Xu, 2009), the fact that school and peer factors become more critical during adolescence as they spend more time away from home (Kotchick, Shaffer, Miller, & Forehand, 2001), and contradictory findings in earlier research, the parent–child relationship may be a more distal predictor rather than a direct predictor of IGA. Thus, it is important to examine the mechanisms through which the parent–adolescent relationship impacts adolescent IGA.

### 1.2. School connectedness as a mediator

Defined as students' enjoyment and interest in school activities, closeness with teachers and classmates, and willingness to do one's schoolwork (Upadyaya & Salmela-Aro, 2013), school connectedness has emerged as a potential major predictor of adolescents' psycho-social problems, academic achievement, and well-being (Eisenberg, Neumark-Sztainer, & Perry, 2003; Li & Lerner, 2011; Shochet & Smith, 2012). In the current study, we ask

whether it can also be a mediator between the parent–adolescent relationship and IGA. Grounded on attachment theory, attachment behaviors can be strengthened through interaction with the primary caregiver (i.e., parent), who contributes most to the adolescent's formation of psychological structures that provide stable representations of the self, others, and the environment (Bowlby, 1969; Shochet, Homel, Cockshaw, & Montgomery, 2008). Parent–adolescent attachment resembles an ongoing bond, and can be regarded as a cognitive experience of warmth, trust, and open communication (Murray, 2009). The relatedness, competence and autonomy derived from parents may become internalized and will promote adaptation and exploration in school contexts (Connell & Wellborn, 1991). Furrer and Skinner (2003) have verified that a high quality parent–adolescent relationship could operate as a motivational resource that had an impact on youths' better school connectedness. In a longitudinal study, Simons-Morton and Chen (2009) showed that a supportive parent–adolescent relationship, including authoritative parenting and parental involvement, played a critical role in promoting long-term school connectedness. Another study examined the influence of adolescent supportive relationships with parents on trajectories of different dimensions of school engagement, and also demonstrated that perceived support from parents was an important buffer against the general declines in emotional connectedness to school found during the secondary school years (Wang & Eccles, 2012). Likewise, low levels of parent–adolescent relationship will impose a restriction on developing school connectedness, and ultimately result in basic psychological needs not being met, a lack that the adolescent may compensate for through Internet games. None of the preceding studies has focused on this question of whether school connectedness as a mediator can buffer the impact of a low quality parent–adolescent relationship on IGA.

The notion that school connectedness slows down escalations in adolescent IGA has been preliminarily advocated by some authors (Kweon & Kim, 2014; Kweon & Park, 2012). In a survey of 557 middle school students in Korea, Kweon and Kim (2014) demonstrated that adolescents with high levels of satisfactory school life were less likely to develop IGA. A similar process was proposed by Kweon and Park (2012), who argued that school connectedness, characterized by conforming to school norms and relationships with peers and teachers, could be identified as a protective factor against IGA during early adolescence. More importantly, a two-wave longitudinal survey in Germany reported that adolescents who were more integrated in their class were less likely to engage in Internet games in a problematic manner during the course of their further development (Rehbein & Baier, 2013). Results above mentioned are consistent with Social Control Theory (Hirschi, 1969), which emphasizes that adolescents with high levels of school connectedness will endeavor to meet the values, norms, and beliefs that are shaped in the school, and for this reason, display fewer problematic behaviors such as IGA.

Although no research has directly examined the presumption of school connectedness as a mediator between the parent–adolescent relationship and IGA, there have been a small number of studies that have played an important role in documenting that the association between family factors and adolescent development can be mediated by school connectedness (Li, Lerner, & Lerner, 2010; Shochet et al., 2008). For instance, Shochet et al. (2008) pointed to the ubiquitous role of parental attachment in depressive symptoms, not only as a direct influence but also an indirect one in its role as a possible precursor to the important proximal variable of school connectedness. In a longitudinal study, it was reported that adolescents who received higher levels of maternal warmth and parental involvement were more likely to have higher perceived academic competence, but only via school connectedness (Li et al., 2010). Based on these findings it is not difficult to

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