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# Beyond peer contagion: Unique and interactive effects of multiple peer influences on Internet addiction among Chinese adolescents



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#### ABSTRACT

This study examined the roles of different aspects of peer context in the peer contagion of Internet addiction among 956 Chinese adolescents (11–19 years, 473 boys and 419 girls). Framed by peer socialization perspectives, the present study examined the unique effects of close peers' social acceptance and normativeness of Internet addiction on adolescents' Internet addiction beyond the putative effects of close peers' Internet addiction. The interactive effects of close peers' social status and friendship quality with close peers' Internet addiction on adolescents' Internet addiction as well as gender differences also were examined. Results showed that male adolescents who were affiliated with peers having lower levels of social acceptance were more likely to develop heightened levels of Internet addiction. Adolescents who were situated in a class with higher levels of Internet addiction also tended to have higher levels of Internet addiction. In addition, male adolescents who perceived their peers possessing higher social status were more vulnerable to peer contagion of Internet addiction. In general, findings suggest the importance of considering multiple facets of peer influences beyond the peer contagion of Internet addiction. Implications for prevention and intervention efforts are discussed.

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#### 1. Introduction

With the development and spread of Internet, adolescents' Internet use has become a big concern in China. The latest National Internet Development Report from China Internet Network Information Center (CNNIC, 2015) showed that the number of 10–19 years old Internet users was about 147.97 million by the end of 2014, which constituted 22.8% of all Internet users in China. Previous research reported that approximately 10% of Chinese adolescents were addicted to Internet (Lam, Peng, Mai, & Jing, 2009; Wang et al., 2013).

Internet addiction, characterized by compulsive Internet use, withdrawal and tolerance symptoms, and interpersonal, health-related, and time management problems (Chen, Weng, Su, Wu, & Yang, 2003), could be detrimental to adolescent development (Greenfield & Yan, 2006). Adolescence is a critical period and the current development of values and behavioral patterns may affect their whole life (Erikson, 1985). A substantial body of research has demonstrated that Internet addicted adolescents display problems

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in their physical and mental health (Cao, Sun, Wan, Hao, & Tao, 2011), personality development (Cho, Kim, Kim, Lee, & Kim, 2008), school performance (Young, 1998), and family relationships (Liu, Fang, Deng, & Zhang, 2012). Research has showed that adolescents are vulnerable to Internet addiction due to their increasing risk-taking behavior, heighted levels of novelty seeking and exploration, and extensive social interactions, especially with peers (Lee, Han, Kim, & Renshaw, 2013).

Despite a large body of research on Internet addiction, our understanding of why some adolescents become addicted to Internet is quite limited (Willoughby, 2008). Peer has been a salient socialization agent in the development of various problem behaviors during adolescence (Rose & Rudolph, 2006). Consistent with the emphasis on deviant peer influences on other problem behaviors (Shi & Xie, 2012; Simons-Morton & Farhat, 2010), research on Internet addiction is limited to address the direct association between adolescents' and their close peers' Internet addiction (Kraut et al., 1998; Liu & Kuo, 2007). However, peer influences are multi-dimensional and we may not get a complete picture of peer contagion effects without considering other peer factors (Brechwald & Prinstein, 2011). In fact, some adolescents may be more likely to become Internet addicted than others when affiliated with addicted peers, suggesting different susceptibilities

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to peer contagion of Internet addiction. As such, beyond the simple fact that involving with deviant peers could contribute to adolescents' development of problem behavior, the present study examined other critical peer influences on Internet addiction as well as under what circumstances effects of peer contagion may exacerbate, which may contribute to targeted prevention and intervention practices.

#### 1.1. Peer and adolescent Internet addiction

Peer factors have been demonstrated among the most salient, robust correlates of adolescents' deviant behavior, including substance use (Hussong, 2002), alcohol use (Trucco, Colder, & Wieczorek, 2011), and smoking (Kobus, 2003). Although dyadic friendship, small-group relationships (clique), and the broader group system (crowd) constitute the complex peer social system (Brown & Klute, 2003), adolescents' adjustment is more likely to be influenced by peer relationships that are more socially proximal than socially distal to the adolescents (Larson, Whitton, Hauser, & Allen, 2007). In support of this idea, Hussong differentiated among best friendships, peer cliques, and social crowds and found that adolescents who were more highly embedded in substance-using close peer contexts showed greater risk for substance use. In addition, this study also found a reduced risk for substance use for adolescents with substance-using best friends if they had other close friends who were less involved with substances. Thus, it is necessary to consider adolescents' all close friends when examining peer contagion effects (Simons-Morton & Farhat, 2010).

Research on the relationship between adolescent Internet addiction and peer context mainly has focused on the reciprocal associations between Internet addiction and peer relationships, including general attachment, peer acceptance, and/or friendship quality. On one hand, the desire for communication motives adolescents to use Internet, where adolescents could satisfy their psychological needs that may not be fulfilled in the real world (Kraut et al., 1998). In support of this idea, poor peer relationship was found as an important predictor of Internet addiction among adolescents (Milani, Osualdella, & Di Blasio, 2009). On the other hand, excessive use of Internet and preoccupation with the virtual reality may drive adolescents away from the real world and thus youth might engage in less communications with peers (Kraut et al.). For example, Internet addicted adolescents are more likely to display many communication problems with peers (Liu & Kuo, 2007) and tend to have poor friendship quality (Harman, Hansen, Cochran, & Lindsey, 2005). An important gap in the literature is that limited studies have integrated several dimensions of peer influences and examined their additive and/or synergetic effects on adolescent Internet addiction. As such, the present study examined how close peers' social acceptance, normativeness of Internet addiction, close peers' social status, and friendship quality with close peers are implicated in the peer contagion of Internet addiction.

#### 1.2. Theoretical foundation and hypotheses

The theoretical grounding for this examination of multiple peer influences on adolescents' Internet addiction is based in peer socialization perspectives, including a social context model of peer influence (Chang, 2004), a social impact perspective (Latané, 1981), and a differential-association perspective (Agnew, 1991). These theoretical models were utilized to examine the independent and interactive effects of various peer factors in the peer contagion of Internet addiction.

First, a social context model of peer influences (Chang, 2004) asserts that peer group norm has profound influences on adolescents' behavior and peers' norm is the major source of constraint forces during adolescence (Blanton & Burkley, 2008). Although best

friends exert the greatest influences in the peer context, it is essential to address the impact of other aspects of peer context to better understand the underlying mechanism of peer contagion of Internet addiction (Simons-Morton & Farhat, 2010). Given that Chinese adolescents (i.e., junior and high school students) spend most of their time in class (Fuligni & Stevenson, 1995), the classroom may be a typical context where peer influences take place (Chang, 2004). Peer acceptance and normativeness of behavior are two critical components of peer norm in the classroom. The level of social acceptance of adolescents' peers in the classroom may indicate the extent to which adolescents' social behavior (Internet addiction in this case) conforms to the normative behavior among classmates. In addition, the average level of Internet addiction in the classroom represents the social context in which adolescents manifest their excessive Internet use behavior and communicate with classmates (Chang. 2004). Thus, we hypothesized that peers' social acceptance and the normativeness of Internet addiction are associated with adolescents' Internet addiction, when controlling for close peers' Internet addiction.

Second, a social impact perspective indicates that a social group varies in its strength of social impact on its members depending on its various levels of social status (Latané, 1981; Shi & Xie, 2012). LaFontana and Cillessen (2010) found that adolescents prioritized social status over friendship, personal achievement, following rules, prosocial behavior, and romantic interests. Adolescents strive for attention and belongings to a specific group and more importantly, for high social status or impact in their peer groups (Ojanen, Grönroos, & Salmivalli, 2005). Thus, these adolescents may be more likely to conform to the behavioral patterns of high social status peers. Thus, we hypothesized that the positive association between close peers' and adolescents' Internet addiction is stronger for adolescents affiliating with peers having higher social status than those affiliating with peers having lower social status.

Finally, a differential-association perspective of delinquent behavior posits that deviant friends are assumed to have more influence provided that relationships with these friends are more close and positive (Agnew, 1991). Consistent with this proposition, social bonding theory states that observational learning from friends is enhanced when having more positive relationships with friends (Berndt, 2002). The magnifying effects of peer relationships on peer contagion have been supported by research on depressive symptoms (Prinstein, 2007), substance use (Urberg, Luo, Pilgrim, & Degirmencioglu, 2003), and antisocial behavior (Piehler & Dishion, 2007). Thus, the present study examined the magnifying effect of adolescents' friendship quality on peer contagion of Internet addiction.

#### 1.3. Gender differences

Although we could not locate any study that has examined gender differences of how peer factors are implicated in peer contagion of Internet addiction, there is evidence for gendered patterns of adolescent Internet use and addiction. Studies consistently found that males are more likely to become Internet addicted than females (Chou & Hsiao, 2000). In addition, males are more likely to be interested in online activities involving violence, power, and/or control whereas females tend to use Internet for communications (Young, 1998). Chou, Condron, and Belland (2005) reviewed studies related to Internet addiction and concluded that "men are more likely subject to Internet addiction" (p. 371), which justifies the need for a better understanding of the gendered patterns of peer influence processes of Internet addiction among adolescents.

Gender has long been demonstrated to be an importance factor in considering adolescents' susceptibility to peer influence in other addictive or problem behaviors. Boys tend to have denser peer

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