Research report

Parent marital conflict and Internet addiction among Chinese college students: The mediating role of father-child, mother-child, and peer attachment

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ABSTRACT

Previous studies have emphasized the effect of parent marital conflict on youth's Internet addiction. However, few researchers have examined the mediating role of parent-child attachment and peer attachment between marital conflict and Internet addiction. To fill this gap, this study aims to examine whether father-child, mother-child, and peer attachment play a mediating role between parent marital conflict and Internet addiction. This cross-sectional study included 450 college students in two universities in China. Structural equation modeling (SEM) was conducted to examine research questions. Results showed that Internet addiction was positively associated with marital conflict and negatively associated with peer attachment. Moreover, both mother-child and father-child attachment mediated the relationship between marital conflict and Internet addiction through peer attachment. To our knowledge, this was the first study examining the mediating role of parent-child and peer attachment between parent marital conflict and youth’s Internet addiction. Our findings suggested that educational workers should pay more attention on the development of youth’s parent-child and their peer attachment, because youth's attachment played an important role in youth’s Internet addiction. Moreover, our findings emphasized that father and mother both important people on the development of youth’s peer attachment, which may in turn influence youth’s Internet addiction.

1. Introduction

With the widely use of Internet, Internet addiction has become a serious problem among adolescents and young adults (Kaltiala-Heino, Lintonen, & Rimpelä, 2004; Park, Kang, & Kim, 2014; Young & Rogers, 1998). On the precise definition of Internet addiction, there was no consensus in previous studies (Davies & Windle, 2001; Young, 1998). Davies and Windle (2001) considered Internet addiction as a pathological Internet use rather than an addicted behavior, and the over-use of Internet can create social, school, and psychological problems in youth’s daily life. In contrast, several others defined Internet addiction as an addicted behavior, and can be regarded as an impulse-control disorder that is unlike the normal substance addiction (Young, 1998). In this study, we followed the definition of Young (1998), and considered those individuals who appeared to be excessive, obsessive, dependent and uncontrollable on the Internet using as having Internet addiction. Internet addiction of youth may cause negative developmental outcomes including low academic performance (Huang et al., 2009; Park et al., 2014), poor dietary habits (Kim et al., 2010), aggressive behavior of society (Cui, Zhao, Wu, & Xu, 2006), partner interaction anxiety (O'дачи & Kalkan, 2010), conflictive family relationships (De Leo & Wulfert, 2013), and higher risks of suicidal ideation and attempt (K. Kim et al., 2006; Lin et al., 2014).

Several empirical studies have been conducted to examine the possible causes of youth's Internet addiction, including external factors and internal factors. For example, as external factors, online communication programs (e.g., email use and instant messaging) and online games (Chou & Hsiao, 2000; van den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008; Tone, Zhao, & Yan, 2014; Yadav, Banwari, Parmar, & Maniar, 2013) were found positively related to youth’s Internet addiction. As for internal factors, emotional attachment (Zhang, Wu, & Lei, 2009), personality traits...
such as low agreeableness and emotional stability (Charlton & Danforth, 2010; Yang & Lei, 2007), loneliness (Bozoglan, Demirer, & Sahin, 2013), low self-control (Ozdemir, Kuzucu, & Ak, 2014), and low self-esteem (Park et al., 2014) were positively associated with youth’s Internet addiction.

Recently, increasing number of studies has emphasized the important impact of family on youth’s Internet addiction. Specifically, studies have found that parent marital conflict predicted a severe Internet addiction of youth (De Leo & Wulffert, 2013; Kalaitzaki & Birtchnell, 2014; Ko, Yen, Lin, & Yang, 2007; Li, Garland, & Howard, 2014; Wang et al., 2011; Yen, Yen, Chen, & Ko, 2007). It is important to examine the underlying mechanisms in the association of parent marital conflict with youth’s Internet addiction, as a better understanding of the underlying mechanisms may offer valuable suggestions to clinicians, educators, and policy-makers to design more effective treatments and prevention programs targeting youth’s Internet addiction.

1.1. The role of parent marital conflict on youth’s Internet addiction

The family system theory (Bowen, 1966) regards family as a basic emotional unit. This theory assumes that pressure from emotional conflict between any two family members can spread into a family triangulation that is a minimum stable emotional unit formed by father, mother, and child. Marital conflict, as an important stressor in the family, may cause children’s problematic behavior (Crych & Fincham, 1990; Stocker & Youngblade, 1999).

Specifically, empirical studies have indeed found that parent marital conflict could influence youth’s Internet addiction. For example, several studies have found that the perceived marital conflict of youth could significantly predict one’s signs of addictive online behavior (De Leo & Wulffert, 2013; Luo & Peng, 2008; Peng & Zhou, 2007; Wang et al., 2011; Yen et al., 2007). In line with these empirical findings, a recent review also emphasized the role of a conflictual family environment on youth’s Internet addiction (Li et al., 2014). They found that youth with Internet addiction were more likely to suffer from dysfunctional family problems including parent marital conflict. Following these findings, we assumed that parent marital conflict could negatively predict youth’s Internet addiction.

1.2. The association of parent marital conflict with parent-child and peer attachment

According to the emotion secure hypothesis theory (Davies & Cummings, 1994), when children perceive parental conflict, they may feel insecure and appear to be fear with parents and/or be away from them. This may cause children’s insecure attachment with their family. Attachment in family can be defined as an enduring emotional bond with either parents or peers (Ainsworth, 1989). Empirical studies have explored the association between marital conflict and children’s attachment. For example, researchers have found that a higher level of parent marital conflict was positively associated with children’s hostility in both father- and mother-child attachment relationships, which may also predict a problematic peer relationship (Owen & Cox, 1997; Stocker & Youngblade, 1999). Therefore, it can be assumed that parent marital conflict was negatively related to youth’s parent-child attachment (i.e., father-child attachment and mother-child attachment) and peer attachment.

1.3. Father-child attachment, mother-child attachment, and peer attachment

Parent-child attachment and peer attachment are positively related. The early attachment theory indicates that a better parent-child relationship could positively influence the development of peer attachment (Bowlby, 1980). This theory suggests that interaction with parents during infancy period could form an internal working model of children in relation to parents, which includes the expectancy about the reliability and availability of important others and the beliefs about personal worthiness of love and support. Attachments formed during infancy may persist throughout individual’s whole life and generalize to relationships with others, and may influence individual’s affect, cognition, and behaviors in subsequent attachment quality including peer attachment (Bowlby, 1980; Ma & Huebner, 2008). Specifically, empirical research has found that peer-attachment was an important mediator between parental-child attachment and several other factors (e.g., adolescents’ life satisfactory, positive social adjustment, and anxiety) (Chen & Feng, 2013; Ma & Huebner, 2008; Wu & Wang, 2014).

Moreover, although researchers normally assumed that father-child attachment was less important than mother-child attachment, father-child attachment has been recently confirmed to have unique contribution to the formation of good peer relationship (Emmanuelle, 2008; Lieberman, Doyle, & Markiewicz, 1999; Lindsey, Caldera, & Tankersley, 2009). The meta-analysis of Fox, Kimmerly, and Schafer (1991) has indicated that secure attachment to one parent was dependent upon the security to the other parent. They indicated that father-child attachment and mother-child attachment was similar. Thus, we assumed that the role of father was as important as mother on youths’ development of peer attachment.

1.4. The relationship between attachment and Internet addiction

A poor parent-child attachment has been found to be a risk factor contributing to children’s addictive online behavior (Lei & Wu, 2007; Luo & Peng, 2008). Moreover, previous studies have found different roles of father-child and mother-child attachment in youth’s Internet addiction. For example, a good quality of father-child relationship negatively predicted adolescents’ Internet addiction directly and indirectly through loneliness, whereas the mother-child relationship merely has an indirect negative effect on Internet addiction through loneliness (Zhang et al., 2011). On the dimensions of parent-child attachment, researchers have found that a high level of father-child trust could predict a low level of adolescents’ Internet addiction, and mother-child alienation positively predicted youth’s problematic behavior (Deng, Fang, Wu, Zhang, & Liu, 2013).

Moreover, several studies also examined the role of youth’s peer attachment in their Internet addiction, and found that the quality of peer-attachment contributed to Internet addiction of adolescents (Lei & Wu, 2009; Li et al., 2014). Specifically, Lei and Wu (2009) have found that peer-attachment could negatively predict adolescents’ Internet addiction. On the dimensions of peer attachment, studies have found peer alienation could directly predict adolescent’s Internet addiction, whereas peer trust and communication have indirect effects on Internet addiction through online games preference and self-identification. Following these findings, it can be assumed that mother-child, father-child, and peer attachment were significantly related with youth’s Internet addiction.

1.5. The mediating role of attachment between parent marital conflict and Internet addiction

Regarding the underlying mechanisms in the association of parent marital conflict with youths’ Internet addiction, parent-child attachment has been found to be a mediator between the two. Specifically, a study found that both father-child attachment and
mother-child attachment played an important mediating role in the relationship between parent marital conflict and youth's Internet addiction (Deng, Fang, & Yan, 2013). These findings suggest that father-child attachment is as important as mother-child attachment on the development of youth's Internet addiction.

Moreover, considering the close associations of peer attachment with parent-child attachment and Internet addiction, it can be assumed that peer attachment might play a mediating role between parent marital conflict and youth's Internet addiction as well. Yet, no studies have been conducted to systematically examine the mediating role of peer attachment between parent marital conflict and youth' Internet addiction.

1.6. The present study

In summary, previous studies have mainly examined single mediator model focusing specifically on parent-child attachment. We were aware of peer attachment was also an important variable not only having negative relationships with parent marital conflict and youth's Internet addiction, but also having positive link with parent-child attachment. However, we were not aware of any studies that have examined the multiple mediating roles of both parent-child attachment and peer attachment in a college sample. Thus, it remains unclear regarding how parent-child attachment and peer attachment jointly mediate the relationships between parent marital conflict and Internet addiction in college students, and whether father plays a vital role, as important as mother, on youths’ peer attachment and Internet addiction. We thought that it would be desirable when examining a number of mediators (i.e., father-child, mother-child, and peer attachment) in the same study to assess whether there are any stronger candidate mediators than others. Therefore, the present study focused on father-child, mother-child, and peer attachment, and aimed to examine whether and how these attachment mediate the relationship between parent marital conflict and youth's Internet addiction. Our hypothesized theoretical model can be seen in Fig. 1. Specifically, we aimed to test the following hypotheses:

**Hypothesis 1.** Father-child attachment, mother-child attachment and peer attachment played a mediation effect on the relationship between marital conflict and Internet addiction.

**Hypothesis 2.** Peer attachment played a mediation effect on the relationship between father-child attachment and Internet addiction, and between mother-child attachment and Internet addiction, respectively.

**Hypothesis 3.** Both father and mother were important people on the development of youth’s peer attachment.

2. Method

2.1. Participates

This study recruited 450 college students (aged 17–23 years old, mean age = 19.82, 61.9% female) from two universities in Xi’an, China. Participants were informed the principle of confidentiality and had the right to exit the investigation at any time. According to the deficiency of data, 433 questionnaires were valid and were used in this study.

2.2. Materials

Participants were asked to complete a paper-and-pencil survey including (i) Internet addiction, (ii) marital conflict, and (iii) attachment with parents and peer.

2.2.1. Internet addiction

We use the Revised Chinese Internet Addiction Scale (CIAS-R) to assess college students’ Internet addiction (Chen, 2003). This scale has been validated and widely used in China before, and good validity and reliability have been reported (Deng et al., 2013; Li et al., 2014; Zhang et al., 2011). The scale contains a total of 26 questions, and is grouped in five dimensions including compulsive use of Internet (5 questions), withdrawal symptoms of Internet addiction (5 questions), tolerance symptoms of Internet addiction (4 questions), interpersonal and health-related problems (7 questions), and time management problems (5 questions). Each question was answered on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree). Total score ranged from 26 to 104, representing the level of Internet addiction. A higher score indicated a higher level of Internet addiction. A cronbach’s α of 0.932 for the total scale was found. The cronbach’s α for compulsive use of Internet, withdrawal symptoms of Internet addiction, tolerance symptoms of Internet addiction, interpersonal and health-related problems, and time management problems were 0.748, 0.782, 0.733, 0.840, and 0.767, respectively.

2.2.2. Marital conflict

A conflict subscale of the Scale of Children’s Perception of Marital Conflict (CPMC), which was developed by Grych and Fincham (1990) and revised by Chi and Xin (2003) in China, was used to measure parent marital conflict in this study. The CPMC consists of 40 questions, and can be grouped into three subscales: the characters of conflict (19 questions), the cognitive of threat (12 questions), and self-attribution (9 questions). In this study, “the characters of conflict’ subscale was used to measure college students’ perception of their parent marital conflict. This subscale

![Fig. 1. The hypothesized model of the present study.](image-url)
includes three dimensions: conflict frequency (6 questions), conflict intensity (7 questions), and conflict resolution (6 questions). The response format was a 5-point Likert-type scale ranging from 1 (never) to 5 (always). Total scores ranged from 19 to 95. Previous studies have proved that the use of this subscale was sufficient for the parent marital conflict measurements in adolescents and youths (Deng et al., 2013; Deng et al., 2012). A cronbach’s α of 0.840 for this subscale was found. The cronbach’s α for the conflict frequency, conflict intensity, and conflict resolution dimensions were 0.691, 0.665, and 0.687, respectively.

2.2.3. Parent-child attachment and peer attachment

We used the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1989) to evaluate students’ attachment level with their parents and peers. Previous studies have proved that it was suitable for youths (Jiang, 2008; Meeus, Oosterwegel, & Vollebergh, 2002). The scale contains 75 questions and includes three subscales: mother-child attachment scale (25 questions), father-child attachment scale (25 questions), and peer attachment scale (25 questions). Every subscale contains three dimensions: trust, communication, and alienation (reversed score). Each subscale was answered on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). The total score ranged from 75 to 225 representing the level of Internet addiction. The higher scores indicated the higher level of attachment quality. A cronbach’s α of 0.847 was found for the total scale in this study. For the mother-child attachment scale, father-child attachment scale, and peer attachment scales, cronbach’s α were 0.740, 0.733, 0.799, respectively.

2.3. Statistical analysis

Descriptive analysis and correlation analysis were performed in SPSS 22.0. Structural equation modeling (SEM) was used to examine the measurement model and mediation models in AMOS 21.0.

Following the suggestions of Anderson and Gerbing (1984), the data analysis procedure for the model assessment was divided into two steps. In Step 1, a confirmatory factor analysis (CFA) was conducted to assess the 5-factor measurement model (i.e., Fig. 1). Hereby we compared the proposed 5-factor model (including parent marital conflict, father-child attachment, mother-child attachment, peer attachment, and youths’ Internet addiction) with a 3-factor model (including parent marital conflict, attachment that was merged by father-child attachment, mother-child attachment, and peer attachment, and youths’ Internet addiction) and a 1-factor model (including one factor, which was merged by all five constructs). The goodness-of-fit indices of these three models were compared to select the best model. Moreover, we used the Fornell and Larcker (1981) test to examine the discriminant and convergent validity of the selected model. Regarding convergent validity, factor loadings of each observed variable of the selected best model were inspected. If factor loadings of all items within a construct (>0.7) were high on that construct and low on the others (factor loadings > cross-factor loadings), it can be concluded that the convergent validity was well. Regarding discriminant validity, Fornell and Larcker (1981) suggested to compare the smallest average variance extracted (AVE) value of each factor with the largest variance value shared between the constructs (the square correlations between the constructs). If the smallest AVE value was higher than the largest variance value, it can be concluded that the discriminant validity was satisfactory.

In Step 2, a structural equation modeling was used to test our hypothesized mediation model (Fig. 1). Several different models were examined. Model 0 was a theoretical model and hypothesized that the five constructs were significantly related with each other. (Fig. 1). Several nested models were conducted and compared. In each nested model, the non-significant paths that were found in previous model were removed in the nested model. First, two nested models examining the full mediation and the partial mediation were compared. Second, on the basis of the selected mediation model, we examined whether father-child attachment and mother-child attachment both played an important role in peer-attachment. We examined two different models, in which the paths connecting father-child attachment to peer attachment and the path connecting mother-child attachment to peer attachment were fixed as zero respectively.

Moreover, in order to examine the significance of the mediating effect of attachment between parent marital conflict and youth’s Internet addiction, a bias-corrected bootstrap procedure was applied. A total of 2000 bootstrap samples were generated according to repeated sampling with replacement method from the original data set (N = 433). Estimates of the standard errors, confidence intervals and p values were obtained. The confidence intervals of standard errors were used to assess the significance of indirect effects. If zero was not included in the interval, the mediation effect was statistically significant (Shrout & Bolger, 2002).

Several indices of the goodness-of-fit were used as criteria for the above model selection. We used CMIN/DF < 2, GFI (goodness fit index) > 0.90, RMSEA (root mean square error of approximation) < 0.05, TLI (Tacker–Lewis index) > 0.90, CFI (comparative fit index) > 0.90, and SRMR (standardized root mean square residual) < 0.05 as the assessing standards of the model fit index.

3. Results

3.1. Correlation analysis

The correlation coefficients among the study variables are shown in Table 1. All correlation coefficients were statistically significant (p < .05). Specifically, marital conflict was negatively correlated to youth’s attachment with mother, father and peers, indicating that marital conflict had an adverse effect on students’ development of emotional attachment. Students’ Internet addiction was positively correlated with marital conflict and negatively correlated with the three different attachments (i.e., peer attachment, father-child attachment, and mother-child attachment). These results suggested that marital conflict could be a risk factor, whereas a more secure attachment with others could be a protective factor for youth’s behavior on Internet. Only when the correlations were significant, can we do structural equation modeling (SEM) analysis as the following.

3.2. Assessment of the measurement model

3.2.1. Confirmatory factor analysis (CFA)

The fit indices of the three CFA models showed that the 5-factor model was better than the 3-factor model and the 1-factor model (see Table 2). This suggested that our 5-factor measurement model was reasonable accepted.

3.2.2. Convergent and discriminant validity

Factor loadings of each item of the 5-factor model were shown in Table 3. All factor loadings were higher than 0.7, and better than any cross-factor loading. According to the criteria of Fornell and Larcker (1981), the convergent validity of our model was satisfactory.

Table 4 presents the average variance extracted (AVE) of each factor and the variance shared between the constructs (the square correlations between the constructs). Squared correlations were reported on the off-diagonals and AVE values were on the diagonal.
The smallest AVE (0.649) was larger than the largest squared correlations (0.179), which indicated that the discriminant validity of the 5-factor model was satisfactory (Fornell & Larcker, 1981).

3.3. Mediation models assessment

The fit indices of the hypothesized model (Model 0, as displayed in Fig. 1) were shown in Table 5, which was relatively reasonable. However, path 3 (β = 0.209, p > 0.05) were non-significant, and path 9 (β = −0.17, p = 0.64) was marginally significant. We therefore compared the baseline model (Model 0) with a nested model (Model 1). In Model 1, the path connecting father-child attachment to Internet addiction (path 3), the path connecting marital conflict to peer attachment (path 5) and the path connecting mother-child attachment to Internet addiction (path 9) were fixed to zero, indicating that there were no relations in them. Model 1 indeed tested a partial mediation. The fit indices showed that Model 1 fitted data very well (see Table 5). The Chi-square difference test indicated there were no differences between Model 1 and Model 0 (Δχ² = 4.537, Δdf = 2, p > 0.05). These results showed that Model 1 fitted better than Model 0.
To test whether the mediation model was partial or full, we compared the partial mediation model (i.e., Model 1) with the full mediation model (i.e., Model 2). In Model 2, the path connecting marital conflict to Internet addiction (path 1) was fixed to zero on the basis of Model 1, assuming that marital conflict could influence youth’s Internet addiction completely through attachments with mother, father, and peers. A significant Chi-square difference test ($\Delta \chi^2 = 11.401, \Delta df = 1, p < 0.01$) suggested that Model 1 fitted better than Model 2 (see Table 5). Thus, it can be concluded that the partial mediation model (i.e., Model 1) was more satisfactory than the full mediation model. Therefore, we selected the partial mediation model (i.e., Model 1).

In order to test whether both father and mother were both important people in the development of peer attachment, we examined two other different nested models on the basis of Model 1 (Model 3 and Model 4). In Model 3, the path connecting father-child attachment to peer attachment was fixed to zero, which imposed that the father-child attachment had no effect on peer attachment. In Model 4, the pathway between mother-child attachment and peer attachment was fixed to zero, which suggested that the mother-child attachment had no effect on peer attachment. Table 5 presents the goodness-of-fit indices for Model 3 and Model 4. The significant Chi-square difference test between Model 1 and Model 3 ($\Delta \chi^2 = 12.810, \Delta df = 1, p < 0.01$) indicated that Model 3 was significantly different than Model 1. A significant Chi-square difference test between Model 1 and Model 4 ($\Delta \chi^2 = 7.973, \Delta df = 1, p < 0.05$) indicated that the Model 4 was also significantly different than model 1. Thus, model 3 and model 4 were both rejected. These results suggested that the contributions of father-child attachment and mother-child attachment to peer attachment were both important factors. Fig. 2 presented the final model of the relationship between marital conflict, attachment and Internet addiction (i.e., Model 1).

3.4. Significance assessment of the selected mediation model: bootstrap analysis

We also examined the significance of the selected mediation model (i.e., Model 1) with the bias-corrected bootstrap procedure. Table 6 presents the mediating effects of the model and their 95% confidence intervals, and showed that all indirect pathways were significant.

4. Discussion

The primary aim of the present study was to examine whether and how parent-child attachment (i.e., father-child and mother child attachment) and peer attachment jointly mediated the relationships between parent marital conflict and college students’ Internet addiction. This was the first study that systematically examining the multiple mediating roles of both parent-child attachment and peer attachment in a college sample. Our findings showed that more parent marital conflict was positively associated with higher levels of Internet addiction in college students, and this link was mediated by parent-child and peer attachment. A novel finding of this study was that parent-child attachments and peer attachment had different impacts on youth’s Internet addiction. Moreover, we also found that father-child and mother-child attachment both played an important mediating role on youth’s peer attachment.

4.1. The direct effect of parent marital conflict on college students’ Internet addiction

Our findings suggested that parent marital conflict was significantly associated with college students’ Internet addiction. This was in line with several previous studies (Davis, 2001; Deng et al., 2012; Wang et al., 2011; Yen et al., 2007). Our findings, together with these previous findings, further indicated that those adolescents and college students who were grown in a more conflictual family environment might be at a higher risk for Internet addiction. Similarly findings have also been reported on several other children problematic behavior including delinquent and substance abuse behavior (Shek, 2002), disordered eating habits (George, Fairchild, Cummings, & Davies, 2014), and children’s maladjustment (Ablow, Measelle, Cowan, & Cowan, 2005). Altogether, it can be concluded that parents should avoid conflicts or arguments in front of their children, as this may contribute to children’s problematic behavior including Internet addiction.

4.2. The mediating role of attachment between parent marital conflict and college students’ Internet addiction

Our findings showed that a higher level of parent marital conflict would lead to poor father-child attachment and mother-child attachment, and both poor father-child and mother-child attachment would lead to poor peer attachment, which in turn had negative impacts on college students’ Internet addiction. These findings corroborate findings of Deng et al. (2013), which found mediating effects of both father-child attachment and mother-child attachment between parent marital conflict and adolescents’ Internet addiction.

![Fig. 2. The final selected mediation model. Note. *p < .05, **p < .01, ***p < .001; the partial mediating influence of father-child attachment, mother-child attachment and peer attachment on the relationships between parent marital conflict and Internet addiction. All pathways were standardized, n = 433. Dashed lines were insignificant.](image-url)
Moreover, the current study considered a new unique mediation factor (i.e., peer attachment), and examined how peer attachment, together with father- and mother-child attachment, mediated the association of parent marital conflict with college students' Internet addiction. This can be interpreted from two perspectives. First, our findings showed that higher parent marital conflict would lead to poor parent-child attachment, and in turn, parent-child attachment would lead to poor peer attachment. This finding was in line with a previous study (Lindsey et al., 2009). They found that children exposed in higher levels of parent marital conflict would have less secure attachment with their father and mother, which in turn would lead to negative peer interaction. Their findings, together with ours, confirmed the Emotion Secure Hypothesis Theory (Davies & Cummings, 1994), which proposed that when children perceived parent marital conflict, they would feel insecure and establish insecure attachment with their parents.

Second, our findings also showed that peer attachment mediated the relationship between parent-child attachment (i.e., father- and mother-child attachment) and youths' Internet addiction. This finding was consistent with the parent-peer linkage hypothesis (Meeus et al., 2002). According to this hypothesis, when children have established secure attachment bonds with parents, they would feel warm, supportive and acceptance from their parents and generalize these positive feelings to their peers, which may help to develop intimate relationships with peers. On the contrary, an insecure parental-child attachment would lead to several negative feelings and emotions, which may lead to an insecure peer attachment. That is, when youth have built an insecurity attachment with their parents and/or peers, they would have to search for other ways (e.g., surf the Internet) to release their negative emotions, and the addictive online behavior might appear finally.

In addition, our study found that peer attachment in college students played a direct effect on students' online behavior. Yet, this direct effect was not found on father- and mother-child attachment. This was in line with findings of Laible (2007) that peer attachment had a stronger association with adolescents’ socio-emotional development than parental-child attachment. Peer attachment was important to encourage youth to attend face-to-face social activity (Lei & Wu, 2009; Nelis & Rae, 2009; Zhang et al., 2009). When youths have poor attachment with their peers, they would be less likely to take part in face-to-face activities and more likely to achieve more communication from Internet, as a virtual world could break limitations of real world and offer a relatively secure communication platform (Huang et al., 2009). However, this does not mean that parent-child attachment was not essential. Although farther-child attachment and mother-child attachment had no direct effects on Internet addition, poor peer attachment was influenced by marital conflict completely through poor parental-child attachment in our final mediation model. This emphasized the irreplaceable role of parent-child attachment on children’s peer attachment.

More important, our findings confirmed that father and mother both important people on the development of youths’ peer attachment. This is consistent with a study of Lindsey et al. (2009), in which they found that both mother-child attachment and father-child attachment were important factors influencing children’s peer interaction.

### 4.3. Implications of the present study

The current study provided important evidence to explain the underlying mechanisms of how parent marital conflicts impact on their children's Internet addiction.

First, this study has important theoretical implications by extending the research field about the relationships between parent marital conflict and youths’ Internet addiction. To our knowledge, the current study was the first to examine an integrated model with a focus on parent marital conflict, parent-child attachment, peer attachment, and students’ Internet addiction. This study revealed a possible mechanism (i.e., two mediation chain: from father-child attachment to peer attachment, and from mother-child attachment to peer attachment) for the effects of parent marital conflict and youths’ Internet addiction. These findings warrant more research on this topic.

Second, this study also has important practical and clinical implications. Our findings suggested that parents should avoid conflicts and argument in front of their children, as their conflicting behavior is a risk factor contributing to youths’ online behavior. Besides, in order to prevent youths from being addicted to Internet, parents should spend more time bonding with their children. When children feel warmth, caring, and love from their family in the real world, they would spend less time in communicating or playing games in the virtual world. Moreover, for clinical workers aiming at treating Internet addiction, they may consider the impacts of family factors and peer factors on youths’ Internet addiction in the intervention design. On one hand, clinicians should take the family environment into account (e.g., whether youths feel the warmth from parents). On the other hand, clinicians may encourage youths to cultivate their friendship with their peers and develop secure attachment, as this could help to improve youths’ Internet addiction.

### 4.4. Limitations and future directions

There were three limitations in this study. First, the use of a cross-sectional design impeded us to examine the causality between the variables. Future longitudinal studies should be conducted to examine the causal direction among parent marital conflict, parent-child attachment, peer attachment, and youth's Internet addiction. Second, this study collected data from college students and did not collect information from their parents or peers, which might have caused common method bias. Future studies are necessary to collect information from multiple ways including their parents and peers. Third, as the current study used only self-reported questionnaires to collect students' characteristics of Internet addiction, we cannot examine the psychological

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**Table 6**

The bootstrapping analysis of the mediation effect on the selected model.

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<th>Pathways</th>
<th>Standard indirect effects</th>
<th>95% CI</th>
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<tr>
<td></td>
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<td>Lower</td>
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<tr>
<td>Marital conflict—father-child attachment—peer attachment</td>
<td>−0.082</td>
<td>−0.132</td>
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<tr>
<td>Marital conflict—mother-child attachment—peer attachment</td>
<td>−0.055</td>
<td>−0.095</td>
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<tr>
<td>Father-child attachment — peer attachment — Internet addiction</td>
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<td>−0.079</td>
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<tr>
<td>Mother-child attachment — peer attachment — Internet addiction</td>
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<td>−0.069</td>
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<td>Marital conflict — father-child attachment — peer attachment — Internet addiction</td>
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<td>0.009</td>
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<td>0.005</td>
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characteristics of Internet addiction. Future studies should include cognitive neuroscience methods such as fMRI and further explore the psychological characteristics of students' Internet addiction.

5. Conclusion

This study found that more parent marital conflict related to more severe Internet addiction through mother-child attachment, father-child attachment and peer attachment in college students. Specifically, higher levels of parent marital conflict may lead to youth poor attachment with father and mother, and this may in turn lead to poor peer attachment, which may influence college students’ Internet behavior. Moreover, our findings showed that both father-child attachment and mother-child attachment played an important role on peer attachment in college students.

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References


