

Parental Phubbing and Children’s Social Withdrawal and Aggression: A Moderated Mediation Model of Parenting Behaviors and Parents’ Gender

Xingchao Wang,¹  Yuran Qiao,¹ Wenqing Li¹ and Li Lei²

Abstract

The present study sought to examine whether parental phubbing was significantly related to children’s social withdrawal and aggression, and determine whether positive and negative parenting behaviors mediated this association. We further examined whether parents’ gender moderated the direct and indirect relationships between parental phubbing and children’s social withdrawal and aggression. The participants included 465 Chinese fathers and mothers from different families, and each father or mother had one child from preschool and early school aged 4–10 years. They completed the measures regarding their experience with parental phubbing, positive and negative parenting behaviors, and children’s social withdrawal and aggression. Results showed that parental phubbing was positively related to children’s social withdrawal and aggression. Positive and negative parenting behaviors significantly mediated the associations between parental phubbing and children’s social withdrawal and aggression. Furthermore,

¹Shanxi University, Taiyuan, China

²Renmin University of China, Beijing, China

Corresponding Author:

Xingchao Wang, School of Educational Science, Shanxi University, No. 92 Wucheng Road, Xiaodian District, Taiyuan 030006, China.

Email: wangxch9@126.com

parents' gender moderated the relationships between parental phubbing and children's social withdrawal and aggression. Specifically, in the mediating model of positive parenting behavior, the pathways from parental phubbing to children's social withdrawal and parental phubbing to children's aggression were significantly different. In the mediating model of negative behavior, the pathway from negative parenting behavior to children's social withdrawal was significantly different.

Keywords

parental phubbing, children's social withdrawal and aggression, positive and negative parenting behaviors, parents' gender

Introduction

Recently, there has been an explosion of smartphone use in everyday family life (Wang, Gao, et al., 2020). In China, most people choose to access the Internet by using smartphones, and the rate has been more than 99.3% of Chinese Internet users by the end of March 2020 (China Internet Network Information Center, 2020). Although smartphones bring us numerous conveniences in our social lives, a number of problems have arisen with their development. For instance, people are distracted by their smartphones and ignore family members and friends (David & Roberts, 2017). A new word "phubbing" is created for describing this phenomenon. In recent years, the phubbing problem has been a common focus of scholars. In the family system, partner phubbing not only influences relationship satisfaction (Wang et al., 2017, 2021) but also impacts partner well-being and mental health (Roberts & David, 2016). Likewise, parental phubbing refers to the parents' act of interrupting parent-child interactions or ignoring their children when they interact with their smartphones (Wang, Wang, et al., 2020). It brings negative results to their children as well. Two studies indicate that smartphone distracts caregivers' attention and reduces responsiveness to the children (Kushlev & Dunn, 2019; Radesky et al., 2014). Specifically, parental phubbing can make parents decreasing positive interactions with their children. This is the basis of children's cognitive development, personality development and social development, and would in turn lead children to develop behavior problems (Kushlev & Dunn, 2019; Radesky et al., 2014). Thus, there is a necessary and pressing need to explore the adverse effects of parental phubbing on children's negative social behaviors, such as social withdrawal and aggression. Growing empirical studies have been interested in

examining the adverse effects of parental phubbing on adolescents' development. For example, Wang and colleagues' study indicates that parental phubbing is more likely to lead adolescents to develop depressive symptoms (Wang, Gao, et al., 2020). However, few studies have elaborately examined the effect of parental phubbing on children's negative behaviors, and the mediating and moderating mechanisms underlying this relationship remain largely unknown. Therefore, the current study determined to investigate the effects of parental phubbing on children's social withdrawal and aggression and extended the previous studies by examining the mediating effects of positive and negative parenting behaviors on this relationship and the moderating effect of parents' gender on this mediation process.

Parental Phubbing and Children' Social Withdrawal and Aggression

The previous studies on parental phubbing have concentrated on the effects among adolescents rather than children (Wang, Gao, et al., 2020; Wang, Wang, et al., 2020). Besides, there are few studies investigating the effect of parental phubbing on children's behavior problems (McDaniel, 2019; McDaniel & Coyne, 2016; McDaniel & Radesky, 2018a, 2018b). Thus, it is of theoretical and practical importance to explore the relationship between parental phubbing and children's negative internalizing and externalizing behaviors, such as social withdrawal (an internalizing behavior) and aggression (an externalizing behavior). Social withdrawal as an isolation process refers to that children isolate themselves from social activities and spend time alone. Throughout the process of development in childhood, it can bring a wide range of predictable adaptability problems (Rubin et al., 2009; Zarra-Nezhad et al., 2014). Furthermore, children's aggression, as one of the most common negative externalizing behaviors, refers to purposefully and intentionally harming others' minds or bodies and destroying other goals, which is not permitted by social norms. Aggression has an obviously negative and stable influence on children's physical and mental health, and easily leads to bad interpersonal relationships (Dodge & Coie, 1987; Huesmann et al., 2009). Attachment theory may help explain the effects of parental phubbing on children's social withdrawal and aggression. Bowlby has proposed the concept of attachment, and defined attachment as an affectional bond between an infant and his or her caregiver. Parent-child attachment can be divided into three types: A (anxiety/avoidance type), B (secure type) and C (anxiety/contradiction type). A and C are also called insecure attachments (Bowlby,

1969). According to attachment theorists' view, early children form the internal working model of self in parent–child attachment and this model would influence children's emotion, cognition, and behavior in the future (Bowlby, 1988). Children who experience secure attachment will build a positive working model of the world and regard their surroundings as approachable and safe. The self is deserving of others' love and believes others are supportive. In contrast, children who experience insecure attachment, will foster an internal working model that other relationships are unavailable or untrustworthy, which in turn leads them to attribute other people's behavior to negative intentions, and face subsequent adverse outcomes including emotional disturbances, social withdrawal, aggression, and substance abuse (Ooi et al., 2006; Vega, 2006). The previous research indicates a strong correlation between the quality of parent–child attachment and outcomes such as social withdrawal and aggression. For example, a cross-sectional study suggests that attachment representation plays a significant role in children's social withdrawal. Children who are insecurely attached may not draw on appropriate cognitive/affective coping skills (Gullone et al., 2006). Furthermore, higher quality of parent–child attachment is associated with lower levels of social stress, lower levels of aggression and higher levels of self-esteem (Ooi et al., 2006). Children who develop insecure attachment may have more aggressive behaviors, less socially confident and lower self-esteem (Lyons-Ruth et al., 1993).

Phubbing parents are willing to occupy time and attention resources to use their smartphones. It may lead them to take less time and fewer resources to their children, and reduce the quality of parent–child relationships (Hong et al., 2019), thereby developing insecure attachment. Some empirical studies have shown that overusing smartphones becomes one serious problem in parent–child relationships (Hong et al., 2019; McDaniel & Radesky, 2018a, 2018b). First, phubbing parents pay less attention to their children and reduce parental monitoring, which can cause children's negative behaviors (Hong et al., 2019; McDaniel & Radesky, 2018a, 2018b). For instance, during family interactions, overusing smartphones makes parents less interested in communication, thereby reducing the quality of the coparenting (McDaniel & Coyne, 2016). Second, parental phubbing is related to decreased feelings of parental warmth and positively related to adolescents' negative externalizing behaviors (Stockdale et al., 2018). Adolescents with high parental phubbing are also more likely to cyberbully others (Wang, Wang, et al., 2020).

Furthermore, parental phubbing significantly leads to adolescents' negative internalizing outcomes such as anxiety and depression (Stockdale et al., 2018). Technology interference between parents and children can significantly predict children's withdrawal behaviors (McDaniel & Radesky,

2018a). Parental phubbing significantly predicts the increase in depressive symptoms of adolescents (Wang, Gao, et al., 2020). Therefore, children who have phubbing parents may develop insecure attachment, thereby developing negative behaviors like social withdrawal and aggression. Given that evidence, we could expect that parental phubbing would significantly increase children's social withdrawal and aggression.

The Mediating Role of Positive and Negative Parenting Behaviors

According to the attachment theory, smartphone use may cause children to develop an insecure attachment with their parents, thereby leading children more likely to develop social withdrawal and aggression. Unfortunately, previous studies do not explore potential mediators on this association. Considering that parenting behaviors are significantly related to children's negative internalizing and externalizing behaviors (Ladd & Ladd, 1998; Murray et al., 2014; Sweenie et al., 2014), we proposed positive and negative parenting behaviors as the potential mediators of the relationships between parental phubbing and children's social withdrawal and aggression. In other words, parents, who have higher levels of phubbing, are more likely to develop negative parenting behavior and less likely to develop positive parenting behavior, which in turn leads their children more likely to develop social withdrawal and aggression. Parenting behaviors were proposed as mediators for two reasons.

First, children who are raised with negative parenting behavior are inclined to show more social withdrawal and aggression. Some studies have supported this argument. For instance, insensitive parenting is significantly associated with social withdrawal among children from Grades 1 to 6 (Booth-LaForce & Oxford, 2008). Negative parenting behavior, such as commands, threats, and deprivations, is related to children's aggression (Nelson et al., 2006). Positive parenting behavior can reduce children's behavior problems by indicating that parents are able to minimize aggression and develop the social skills of their children (Singh et al., 2007). Adolescents' perceptions of parental warmth are consistently associated with lower internalizing and externalizing behavior problems (Elsaesser et al., 2017; Stockdale et al., 2018)

Second, parental phubbing as a risk factor is significantly associated with negative parenting behaviors, such as lower attention and responsiveness, fewer verbal and nonverbal interactions, less organized parenting, and negative reactions of children (Kushlev & Dunn, 2019). Specifically, one study

proposes possible reasons to explain why parental phubbing may lead to negative parenting behavior (McDaniel et al., 2019). First, time spending on smartphones would displace or reduce positive parenting behavior with their children. Second, phubbing parents are interrupted by smartphones, and it is difficult for them to switch attention between using their smartphones and being responsive to their children. When parents pay attention to their phones, they may have a hard time to accurately interpret their children's behaviors and intentions (Radesky et al., 2016). Third, parents dealing with tasks on the phones may feel stressed, thereby inducing negative emotions, and this may lead to negative parenting behavior (Radesky et al., 2016). These reasons show that parental phubbing is likely to reduce positive parenting behavior and increase negative parenting behavior. Multiple researches have supported this link. For instance, one study has shown that parents easily get angry at children due to interrupting their phone use (Radesky et al., 2016). Research suggests that when children attempt to divert the parent's attention away from the device, researchers have observed sometimes harsher parental responses (Radesky et al., 2014). Furthermore, the responsiveness and interactions of parenting decrease when attention is split between smartphones and children (McDaniel et al., 2019), and parents feel less connected to their children by using their smartphones as well (Kushlev & Dunn, 2019). Some studies also suggest that phubbing parents displace positive real-world experiences and decrease social engagement and relationship satisfaction, thereby interrupting parent-child play or reducing parent responsiveness, which can contribute to child behavioral problems (Liu et al., 2012; McDaniel & Coyne, 2016; McDaniel & Radesky, 2018a, 2018b). Thus, it is possible that parents, who have higher levels of phubbing, would have more negative parenting behavior and less positive parenting behavior.

Parents' Gender Difference

Although parental phubbing may predict children's social withdrawal and aggression through positive and negative parenting behaviors, not all children are equally influenced by parental phubbing. Thus, we suggested parents' gender as a possible moderating variable. Parents' gender plays different roles in children's attachment and parent-child interaction, and impacts children's emotions and social relationships in different ways. Specifically, according to the father-child activation relationship theory (Gaumon & Paquette, 2013; Paquette, 2004), fathers generally are inclined to play physical games with children, encourage them to take risks and to be brave in

unfamiliar situations. Children who are in high-quality activation relationships are more likely opening themselves to the world as well as learning their own appropriate way to deal with strangeness and threats in the environment. Furthermore, the roles of fathers and mothers also show the difference in the Chinese context. In Chinese culture, the father is usually seen as the head of the family and represents authority and discipline. They make rules and have a greater responsibility to develop a sense of morality for their children (Short et al., 2001). While mothers are often seen as the most central caregivers and shoulder the most responsibility for children's daily needs (Short et al., 2001). Moreover, compared with the 'exploration' way of fathers, the 'security' way is usually associated with the mother. They tend to comfort and calm children to get out of stress instead of conducting them to take risks (Gaumon & Paquette, 2013; Paquette, 2004). Therefore, it is reasonable to conceive that the roles of fathers and mothers are complementary, and this complementarity would be important to children's development. However, in predicting children's outcomes, only a few studies have explored parents' gender differences (Carson & Parke, 1996; Gaumon & Paquette, 2013; Murray et al., 2014; Paquette, 2004; Simons & Conger, 2007). For example, Carson and Parke (1996) find that when fathers respond negatively to their children's negative emotions, children are more likely to have more aggressive and avoidant behaviors in peer relationships. Another study has examined the roles of the quality of mother-child and father-child relationships in buffering the impact of inappropriate parenting behaviors on subsequent adolescent aggression. The result indicates that the low-quality association which the adolescent shares with the opposite gender parent is more like to increase the risk for aggression (Murray et al., 2014).

Parents' gender differences may impact the relationships between parental phubbing and children's social withdrawal and aggression. According to previous studies, it is reasonable to expect that maternal and paternal phubbing may have different influences on children's social withdrawal and aggression. Unfortunately, to our knowledge, no previous studies have examined whether parents' gender would moderate the effects of parental phubbing on children's social withdrawal and aggression via positive and negative parenting behaviors. One study has roughly supported this view by showing that mothers are associated with less parent-child interaction, especially non-verbal interaction, when they are using smartphones (Radesky et al., 2015). Thus, we proposed that the relationships between parental phubbing and children's social withdrawal and aggression through positive and negative parenting behaviors would moderate by parents' gender.

The Current Study

The current study provided a model to fill the gap in understanding the effect of parental phubbing on children's social withdrawal and aggression. Based on the attachment theory and previous literature, the following associations were tested. First, we explored whether positive and negative parenting behaviors would mediate the relationships between parental phubbing and children's social withdrawal and aggression. Second, we examined whether parents' gender would moderate the direct and indirect associations between parental phubbing and children's social withdrawal and aggression. Focused on two questions that would form a model in the association between parental phubbing and children's social withdrawal and aggression, we proposed the following hypotheses:

*H*₁: Positive and negative parenting behaviors would mediate the associations between parental phubbing and children's social withdrawal and aggression.

*H*₂: Parents' gender would moderate the relationships between parental phubbing and children's social withdrawal and aggression via positive and negative parenting behaviors.

Method

Participants

In this study, the participants were from 511 Chinese families. A father or mother from each family was recruited by online questionnaires. The informed consent was obtained from all participants at first. Specifically, each family had one child from preschool and early school aged 4–10 years. To be eligible to participate, individuals had to be in a marriage, which means there were no single-parent families in this study. Finally, 465 valid questionnaires were obtained after eliminating invalid questionnaires, and the effective rate was 91%. Data from 465 families (fathers: $n = 227$, mothers: $n = 238$) were used in the current study. They were distributed in 26 provinces, and their child's average age was 6.18 ± 1.88 years. Among the children 64.9% ($N = 302$) aged 4–6 years and 35.1% ($N = 163$) aged 7–10 years. We recorded educational levels of fathers and mothers in four categories, with 9.3% having completed senior middle school or lower level; 12.5% having completed college degree; 64.9% having completed bachelor's degree; 13.3% having completed master's degree or higher level.

Measures

Parental phubbing.

Parental phubbing was assessed by the 11-item Parental Phubbing Scale revised by Partner Phubbing Scale (Roberts & David, 2016) and by Phubbing Scale (Karadağ et al., 2015). Parents rated each item (e.g., The time allocated to accompany with my child decreases because of my smartphone) on a 5-point scale ranging from 1 = *never* to 5 = *always*, and the higher the score represented the phenomenon of parental phubbing more serious. In this research, the fit indices of CFA were: $\chi^2 = 20.70$, $df = 26$; NFI = 0.99; GFI = 0.99. It showed that the model provided a good fit for the data. Cronbach α was 0.87 in the current study.

Positive and negative parenting behaviors.

Positive and negative parenting behaviors were measured by Parent Behavior Inventory (PBI) (Christine Lovejoy et al., 1999). Jia et al. (2013) translated this scale into a Chinese version and the reliability and validity were good (Jia et al., 2013). In this study, we used the Chinese version to examine parenting behaviors. It included two subscales: positive parenting behavior scale and negative parenting behavior scale. Each subscale had 10 items, totaling 20 items. The representative items were “I listen to my child’s feelings and try to understand them” and “I say mean things to my child that could make him/her feel bad”. Items were rated on a 6-point scale ranging from 0 = *never* to 5 = *always*. Higher scores of the positive parenting scale indicated higher levels of positive parenting behavior, and higher scores of the negative parenting scale indicated higher levels of negative parenting behavior. In the current study, the fit indices of CFA were: $\chi^2 = 202.63$, $df = 104$; NFI = 0.94; GFI = 0.95; TLI = 0.96; CFI = 0.97; RMSEA = 0.05. It showed that the model provided a good fit for the data. In this research, the Cronbach α for the positive parenting behavior and negative parenting behavior scale were 0.85 and 0.87, respectively.

Social withdrawal.

Achenbach child behavior checklist (CBCL), the revised edition of 1991 (Achenbach, 1991a, 1991b), was used in this study. Specially, we used the social withdrawal subscale for parents whose children aged 4–10, to examine children’s social withdrawal. The social withdrawal subscale had nine questions. Children’s withdrawal behaviors consisted of items such as “shy” and “won’t talk.” Higher scores indicated higher levels of social withdrawal. Items were rated on a 3-point scale ranging from 0 = *not true as far as you know* to 2 = *very true or often true*. In the current study, the fit indices of CFA

were: $\chi^2 = 20.34$, $df = 19$; NFI = 0.98; GFI = 0.99. In the current study, Cronbach α was 0.81.

Aggression.

The aggression subscale of Achenbach CBCL was also used in this study to examine children's aggression (Achenbach, 1991a, 1991b; Jia et al., 2013). This subscale had 20 questions. Children's aggressive behaviors consisted of items such as "attacks people" and "destroys own things." Higher scores indicated higher levels of aggression. Items were rated on a 3-point scale ranging from 0 = *not true as far as you know* to 2 = *very true or often true*. In this study, the fit indices of CFA were: $\chi^2 = 116.71$, $df = 120$; NFI = 0.96; GFI = 0.98, and Cronbach α was 0.89.

Procedure

Ethical approval was gained from the first author's University Ethics Committee. It was important for participants to click on the hyperlink that took to the consent page, and only those who have fulfilled the consent process were allowed to access to questionnaires. Then, participants filled out anonymous online questionnaires consisting of parental phubbing, parenting behaviors, and child's social withdrawal and aggression. They also were assured their data would be confidential and were told to free to withdraw at any time. In addition, the online questionnaires were designed to ensure that questionnaires could not be submitted unless all questions were completed. Participants were considered to withdraw from the survey if they did not complete all the questions which resulted in their questionnaire not being submitted. In online questionnaires, participants were recruited through convenient sampling by the network links and WeChat access links of the online questionnaire platform. Specifically, we shared the link and invited people to fill in the questionnaire. These contacts subsequently forwarded the link to more people on their smartphones and so on. The data were collected during June 2017.

Data Analysis

We analyzed all data by using SPSS 22.0 and AMOS 22.0 software. First, we computed descriptive statistics and performed Pearson correlations to analyze the relationships among parental phubbing, positive parenting behavior, negative parenting behavior, and children's social withdrawal and aggression.

Second, in order to examine the mediation effects of positive and negative parenting behaviors, we used structural equation modeling (SEM) to construct the mediation models. In SEM analysis, we used topic packaging strategy for items packaging, according to Wu and Wen (2011).

Third, we used SEM analysis to examine whether parents' gender could moderate the relationships among parental phubbing, positive parenting behavior, negative parenting behavior, and children's social withdrawal and aggression. The differences between the mother group ($n = 238$) and the father group ($n = 227$) were tested by multigroup analysis.

A variety of goodness-of-fit indices were used to assess the adequacy of model fit. Specially, fit indices include χ^2 , df , Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Normal of Fit Index (NFI), Tucker-Lewis Index (TLI) and Goodness-of-Fit Index (GFI). The cut-off standards of these fit indices are as follows: RMSEA of 0.08 or less are accepted; CFI, NFI, TLI and GFI values greater than 0.90 are accepted.

Results

Descriptive Analyses and Bivariate Analyses

Means, standard deviations, and correlations for all variables are presented in Table 1. Parental phubbing was negatively associated with positive parenting behavior, and positively associated with negative parenting behavior and children's social withdrawal and aggression. Positive parenting behavior was negatively associated with negative parenting behavior, children's social withdrawal and aggression. Negative parenting behavior was positively associated with children's social withdrawal and aggression. Children's social withdrawal was positively associated with aggression.

Testing for Mediation Effect

First, we used SEM to examine the mediating effect of positive parenting behavior between parental phubbing and children's social withdrawal and aggression. The direct paths from parental phubbing to children's social withdrawal ($\gamma = 0.26, p < .001$) and aggression ($\gamma = 0.36, p < .001$) were significant. Moreover, parental phubbing negatively predicted positive parenting behavior ($\gamma = -0.11, p < .05$), and positive parenting behavior negatively predicted children's social withdrawal ($\gamma = -0.28, p < .001$) and aggression ($\gamma = -0.20, p < .001$). A partially mediated model with a mediator from parental phubbing to children's social withdrawal and aggression revealed a good fit to the data: $\chi^2(60, N = 465) = 255.59, p < .001$; RMSEA = 0.08; NFI = 0.92;

Table 1. Descriptive Statistics and Correlations for All Variables.

| Variable | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|----------|-----------|--------|--------|--------|--------|---|
| 1. Parental phubbing | 30.34 | 6.89 | 1 | | | | |
| 2. Positive parenting behavior | 33.43 | 6.19 | -.09* | 1 | | | |
| 3. Negative parenting behavior | 14.11 | 7.17 | 0.47** | -.32** | 1 | | |
| 4. Social withdrawal | 3.06 | 3.04 | 0.24** | -.25** | 0.38** | 1 | |
| 5. Aggression | 9.43 | 6.55 | 0.33** | -.20** | 0.42** | 0.51** | 1 |

Note. * $p < .05$; ** $p < .01$.

CFI = 0.94; TLI = 0.92 and GFI = 0.93. That is, parental phubbing could not only directly predict children's social withdrawal and aggression but also indirectly predict children's social withdrawal and aggression through positive parenting behavior. Therefore, positive parenting behavior partially mediated the association between parental phubbing and children's social withdrawal, and the mediating effect was 0.031, accounting for 10.47% of the total effect of the specific path. Similarly, positive parenting behavior partially mediated the association between parental phubbing and children's aggression, and the mediating effect was 0.023, accounting for 5.99% of the total effect of the specific path (Figure 1).

Second, we used SEM to examine the mediating effect of negative parenting behavior between parental phubbing and children's social withdrawal and aggression. The direct path from parental phubbing to children's social withdrawal became nonsignificant. The direct path from parental phubbing to aggression was significant ($\gamma = 0.16, p < .01$). Furthermore, parental phubbing positively predicted negative parenting behavior ($\gamma = 0.53, p < .001$), and negative parenting behavior positively predicted children's social withdrawal ($\gamma = 0.42, p < .001$) and aggression ($\gamma = 0.41, p < .001$). A partially mediated model with a mediator from parental phubbing to children's social withdrawal and aggression revealed a good fit to the data: $\chi^2(49, N = 465) = 236.34, p < .001$; RMSEA = 0.09; NFI = 0.93; CFI = 0.94; TLI = 0.92 and GFI = 0.93. That is, parental phubbing could not only directly predict children's social withdrawal and aggression but also indirectly predict children's social withdrawal and aggression through negative parenting behavior. Therefore, negative parenting behavior partially mediated the association

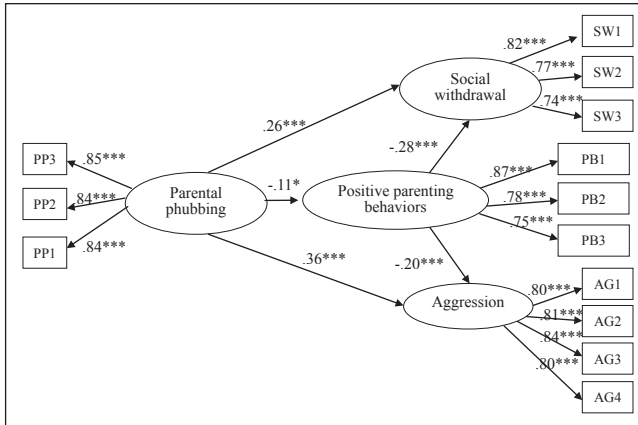


Figure 1. The Mediation Model of Positive Parenting Behaviors.

Note. PPI-PP3 are the 3 packages of 11 items of Parental Phubbing Scale, PBI-PB3 are the 3 packages of 9 items of The Chinese version of Parent Behavior Questionnaire (PBI), SW1-SW3 are 3 packages of positive parenting behaviors of 9 items of social withdrawal and AG1-AG4 are 4 packages of 20 items of aggression of Achenbach CBCL.

* $p < .05$; ** $p < .01$; *** $p < .001$.

between parental phubbing and social withdrawal, and the mediating effect was 0.22, accounting for 77.46% of the total effect of the specific path. Negative parenting behavior also partially mediated the association between parental phubbing and children’s aggression, and the mediating effect was 0.21, accounting for 57.53% of the total effect of the specific path (Figure 2).

Parents’ Gender Difference

The multigroup analyses were used to identify whether the path coefficients differed significantly across parents’ gender. The first model was compared, which allowed the structural paths to vary across mothers and fathers, with the second model, which constrained the structural paths across mothers and fathers to be equal, to examine parents’ gender differences. In the mediating model of positive parenting behavior, there is a significant difference between fathers and mothers, $\Delta\chi^2 (4, N = 465) = 20.79, p < .001$. And this model fit the data well: $\chi^2 (120, N = 465) = 333.18, p < .001$; RMSEA = 0.062; CFI = 0.93. Then we tested each of the five pathways to investigate whether any pathway had different path coefficients between fathers and mothers that contributed to the deterioration of the model. The results

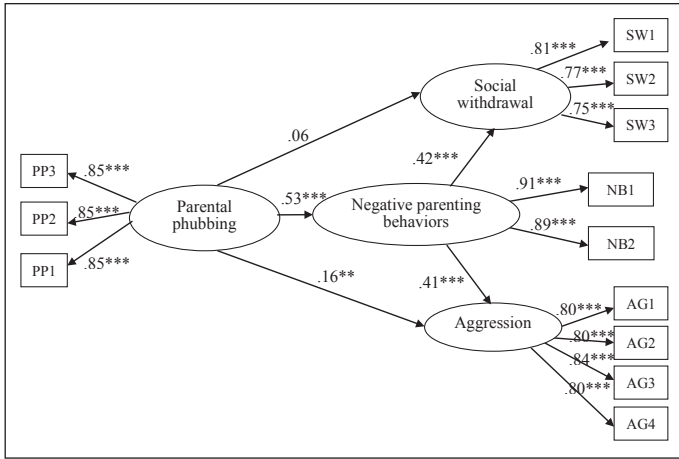


Figure 2. The Mediation Model of Negative Parenting Behaviors.

Note. PP1-PP3 are the 3 packages of 11 items of Parental Phubbing Scale, NBI-NB2 are 2 packages of negative parenting behaviors of 8 items of The Chinese version of Parent Behavior Questionnaire (PBI), SW1-SW3 are 3 packages of 9 items of social withdrawal and AG1-AG4 are 4 packages of 20 items of aggression of Achenbach CBCL.

* $p < .05$; ** $p < .01$; *** $p < .001$.

indicated that when the pathway between parental phubbing and children's social withdrawal was set equal, χ^2 value increased significantly, $\Delta\chi^2(1) = 10.86, p < .001$. The path coefficient for fathers ($\gamma = 0.38, p < .001$) was greater than the coefficient for mothers ($\gamma = 0.09, p > .05$). When the pathway between parental phubbing and aggression was set equal, χ^2 value increased significantly, $\Delta\chi^2(1) = 10.23, p < .01$. The path coefficient for fathers ($\gamma = 0.45, p < .001$) was greater than the coefficient for mothers ($\gamma = 0.24, p < .01$). We further tested the critical ratios of differences (CRD) by dividing the difference between two estimates by an estimate of the standard error of the difference (Arbuckle, 2003). The CRD analysis indicated that the structural path from parental phubbing to children's social withdrawal was identified to be significantly different, $CRD = 3.32 (p < .05)$. Additionally, the structural path from parental phubbing to children's aggression was also different, $CRD = 3.19 (p < .05)$. However, other structural paths were non-significant (Figure 3). These results indicate that maternal phubbing is more likely to influence children's social withdraw and aggression via positive parenting behavior, and paternal phubbing is more likely to influence children's social withdrawal and aggression directly.

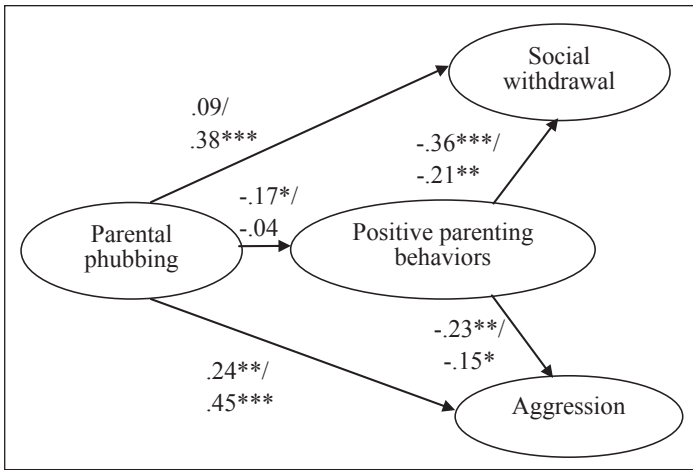


Figure 3. The Multiple Group Analysis Model of Parental Gender in Positive Parenting Behaviors.

Note. The first data of each group is the mothers' standard coefficients, the second is the fathers' standard coefficients.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Similarly, in the mediating model of negative parenting behavior, there is a significant difference between fathers and mothers, $\Delta\chi^2(4, N = 465) = 22.95, p < .001$. Furthermore, this model fit the data well: $\chi^2(98, N = 465) = 296.47, p < .001$; RMSEA = 0.066; CFI = 0.94. Then we tested each of the five pathways to investigate whether any pathway had different path coefficients between fathers and mothers that contributed to the deterioration of the model. The results indicated that when the pathway between negative parenting behavior and children's social withdrawal was set equal, χ^2 value increased significantly, $\Delta\chi^2(1) = 5.05, p < .05$. The path coefficient for fathers ($\gamma = 0.50, p < .001$) was greater than the coefficient for mothers ($\gamma = 0.29, p < .01$). We further tested the CRDs by dividing the difference between two estimates by an estimate of the standard error of the difference (Arbuckle, 2003). The CRD analysis indicated that the structural path from negative parenting behavior to children's social withdrawal was identified to be significantly different, $CRD = 2.27 (p < .05)$. However, other structural paths were nonsignificant (Figure 4). These results indicate that compared with maternal phubbing, paternal phubbing is more likely to influence children's social withdrawal via negative parenting behavior.

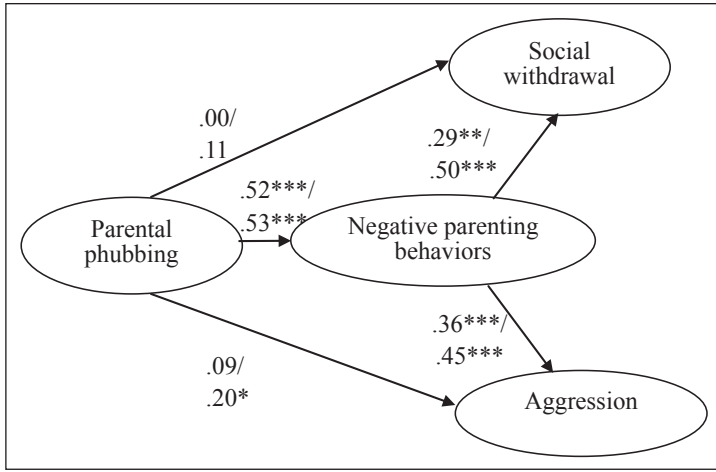


Figure 4. The Multiple Group Analysis Model of Parental Gender in Negative Parenting Behaviors.

Note. The first data of each group is the mothers' standard coefficients, the second is the fathers' standard coefficients.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion

In recent years, parental phubbing has become a common phenomenon and gains substantial support for its adverse effects (Wang, Gao et al., 2020; Wang, Wang et al., 2020). However, it is still unclear of the mediating and moderating mechanisms in the relationships between parental phubbing and children's social withdrawal and aggression. We added to the knowledge about this matter by examining the mediating effects of parenting behaviors and parents' gender differences to confirm those variables that can help explain and alter this relationship. First, our finding showed that parental phubbing was significantly associated with children's social withdrawal and aggression, and this relationship was partially mediated by positive parenting behavior. Additionally, negative parenting behavior fully mediated the relationship between parental phubbing and children's social withdrawal, and partially mediated the association between parental phubbing and children's aggression. Second, the relationships between parental phubbing and children's social withdrawal and aggression were moderated by parents' gender. Specifically, in the mediating model of positive parenting behavior, the pathways from parental phubbing to children's social withdrawal and aggression

were significantly different between fathers and mothers. In the mediating model of negative parenting behavior, the pathway from negative parenting behavior to children's social withdrawal was significantly different between fathers and mothers.

The Mediating Effects of Positive and Negative Parenting Behaviors

Consistent with our expectations, parental phubbing significantly and positively predicted children's social withdrawal and aggression. Our findings are in line with previous studies that parental technology use significantly predicts children's internalizing and externalizing behavior problems (McDaniel & Radesky, 2018a, 2018b). That is, children experiencing higher levels of parental phubbing are more likely to develop social withdrawal and aggression. Furthermore, we tested and confirmed that positive and negative parenting behaviors mediated this relationship. Unlike previous findings which only examined adolescents (Wang, Gao, et al., 2020; Wang, Wang, et al., 2020) or ignored the potential mediating mechanisms (McDaniel & Radesky, 2018a, 2018b), our study innovatively argues for the important role of positive and negative parenting behaviors in helping to explain the relationship between parental phubbing and children's social withdrawal and aggression. Therefore, we chose parenting behaviors, which have a great influence on children's development of social emotion and behaviors, as a mediator in the relationship between parental phubbing and children's social withdrawal and aggression.

Our finding indicated that positive parenting behavior partially mediated the relationships between parental phubbing and children's withdrawal and aggression. Negative parenting behavior fully mediated the relationship between parental phubbing and children's withdrawal and partially mediated the relationship between parental phubbing and children's aggression. That is, phubbing parents are more likely to reduce positive parenting behavior and increase negative parenting behavior, and the low quality of parenting behaviors as a risk factor will influence children to develop social withdrawal and aggression. It not only consistent with our first hypothesis but also provides new evidence to support previous studies that parenting is significantly associated with children's behavior problems (Booth-LaForce & Oxford, 2008; Haapasalo & Tremblay, 1994; Singh et al., 2007). The attachment theory can help explain these findings. According to the attachment theory, phubbing parents may have insecure attachment with their children, which causes children to experience the parent's psychological distance, and raises

the feeling of being neglected (Hong et al., 2019; McDaniel et al., 2019; Wang, Wang, et al., 2020). These feelings would lead children to have high social withdrawal and aggression.

Moreover, the value of the current study in Chinese culture is remarkable. As a collectivist country, Chinese people have collectivist values such as group-oriented or focused on social outcomes (Prioste et al., 2015). Thus, individuals in China emphasize family relationships, and this value is also reflected in parenting. Unlike individualist countries, parent–child relationships have been regarded as more important than marital relationships in Chinese culture (Miller et al., 2013; Wang, Gao, et al., 2020). Therefore, Chinese children are more likely to experience being neglected when parents pay attention to their phones. In addition, in collectivist countries, effective parenting may involve politeness, discipline, promotion of interdependence, and cooperation in children (Diao & Zheng, 2008; Grusec et al., 1997; Prioste et al., 2015; Rudy & Grusec, 2006). Children who have phubbing parents are less likely to learn these qualities and in turn lead to behavior problems. Thus, the adverse effect of parental phubbing on children’s social withdrawal and aggression may have more impacts in China than in other countries. Therefore, exploring the effects of parenting behaviors in the Chinese context can provide a new perspective for researchers of individualist countries. In sum, we extend previous studies by confirming the mediating effects of positive and negative parenting behaviors on the relationship between parental phubbing and children’s social withdrawal and aggression.

Parents’ Gender Difference

Our result indicated that parents’ gender significantly moderated the relationship between parental phubbing and children’s social withdrawal and aggression. It is important to note that in the mediation model of positive parenting behavior, parents’ gender significantly moderates the effect of paternal phubbing on children’s social withdrawal. Specifically, parents’ gender moderated the link between parental phubbing and children’s social withdrawal, with the positive effect being significant only in fathers. This finding is consistent with father–child activation relationship theory and previous results that children who have a low level of activation relationship with fathers are more likely to have internalizing disorders, and develop maladapted behaviors to solve problems (Gaumon & Paquette, 2013). Additionally, parents’ gender significant moderates the effect of paternal phubbing on children’s aggression. Specifically, compared with maternal phubbing, paternal phubbing is more likely to increase children’s aggression. This finding is consistent with fathers’ role in the Chinese context. Fathers, as an important authority role,

generally make rules and develop a sense of morality for their children (Short et al., 2001). Once fathers draw attention to smartphones, children are more likely to be out of control, thereby performing immoral behaviors such as aggression (Gaumon & Paquette, 2013; Paquette, 2004). Moreover, fathers are more likely to regard themselves as providers and family mediators (Short et al., 2001). Therefore, fathers' involvement is less than mothers' in all aspects of parenting except for physical play (Gaumon & Paquette, 2013; Short et al., 2001). In the contrast, mothers spend more time caring for their children and having more opportunities to participate in their children's rearing than fathers, while fathers spend less time participating in parent-child activities (McDaniel & Radesky, 2018b; Paquette, 2004). Accordingly, fathers influence children mainly in a direct way.

Furthermore, in the mediation model of negative parenting behavior, parents' gender significantly moderates the effect between negative parenting behavior and children's social withdrawal. Specifically, compared with maternal phubbing, paternal phubbing is more likely to increase children's social withdrawal via negative parenting behavior. Our result roughly supported the previous study that fathers who are more likely to respond to their children negatively might lead their children to have more maladaptive behaviors (Carson & Parke, 1996). One possible explanation is that compared with mothers, fathers are more likely to show less patient and more negative parenting behavior seriously like punishment and scold when they spend time on the smartphones, these would lead children to develop high social withdrawal.

Previous empirical research has roughly supported that the effect of parents' gender on children's social withdrawal and aggression is different (Carson & Parke, 1996; Murray et al., 2014). However, the current study is the first, to our knowledge, to illustrate that parents' gender as a moderator significantly moderates the effect of parental phubbing on children's social withdrawal and aggression via positive and negative parenting behaviors. We extended existing literature by uncovering when these direct and indirect effects become strong. However, the role of parents' gender in the relationship between parental phubbing and children's social withdrawal and aggression via positive and negative parenting behaviors is very complicated. Thus, it is necessary to go further exploration of the parents' gender effect.

Limitations and Future Directions

Several limitations should be acknowledged. First, the results of the current study were based solely on parents' self-reports, which may lead to the findings be influenced by single-reporter bias. Therefore, laboratory observation

methods should be considered, such as videotaped coding and other objective evaluation methods, to reduce the deviation. Second, the current study was a cross-sectional study, which can not reveal the developmental prediction relationship between variables. Longitudinal studies should be considered in the future to examine the development trend of the relationship between parental phubbing and children's behavior problems. Third, we examined the relationship between only paternal or maternal phubbing and children's behavior problems. Nevertheless, behaviors of family members are affected by each other. Furthermore, parent–grandparent coparenting is an important family variable in contemporary urban China (Li & Liu, 2020). Parent–grandparent coparenting emphasizes the joint participation and shared responsibility of parents and grandparents in the upbringing of children. In such a situation, family interpersonal relationships may be more complex because it has changed from interactions between two generations to interactions between three generations (Li & Liu, 2020). Thus, parental phubbing may have different effects on children's social withdrawal and aggression in parent–grandparent coparenting families. Future studies can explore the factors of both parents, parent–grandparent coparenting, and other influencing mechanisms to enrich the results in related fields. Fourth, in this study, parental phubbing can predict children's social withdrawal and aggression, but children's social withdrawal and aggression may also adversely affect parents' smartphone use. That is, there may be a bidirectional relationship between parental phubbing and children's behavior problems, which needs further exploration in the future. Fifth, this study used online questionnaires to collect data, and the acceptance area was mainly the urban area with widespread Internet access. The sample in this study may bring sampling bias. Thus, generalization of results needs to be cautious. Furthermore, online questionnaires are not convenient for collecting family variables as much as possible. These issues must be taken into account in future studies.

Although this study has some limitations, it makes several theoretical and practical contributions and implications for future research. First, the present study is the first to confirm that parental phubbing has an indirect effect on children's withdrawal and aggression through positive and negative parenting behaviors, and this association is moderated by parents' gender. This will contribute to the understanding of how and when parental phubbing increases children's social withdrawal and aggression. Second, compared with the previous study (Wang, Gao, et al., 2020; Wang, Wang, et al., 2020), this study examined parental phubbing from the parents' perspective, rather than from the adolescents' view. It can provide a new angle to explore the effects of parental phubbing in different aspects. Last, this study revised the Parental Phubbing Scale, which has good fits for reliability and validity. The scale

provides a new measure to examine the relationship between parental phubbing and other variables for future research.

Acknowledgments

We appreciate Jing Jin for her contribution in data collection.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support with respect to the research, authorship, and/or publication of this article: This work was supported by the Ministry of education of Humanities and Social Science project (20YJC190021).

ORCID iD

Xingchao Wang  <https://orcid.org/0000-0003-4472-189X>

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Author Biographies

Xingchao Wang is a professor in the School of Educational Science, Shanxi University, China. His research interests are in adolescents' cyberbullying perpetration, aggression, bullying, moral disengagement, and parental phubbing.

Yuran Qiao is a postgraduate student in the School of Educational Science, Shanxi University, China. Her research interests are in parental phubbing, children's aggression, and moral disengagement.

Wenqing Li is a postgraduate student in the School of Educational Science, Shanxi University, China. His research interests are in parental phubbing, adolescents' moral disengagement, and cyberbullying perpetration.

Li Lei is a professor in the School of Education, Renmin University of China, Renmin University of China. His research interests are in cyber psychology and adolescents' personality and social development.