Parenting Style, Personality Traits, and Interpersonal Relationships: A Model of Prediction of Internet Addiction

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This study examined how parenting style can help or hinder the development of healthy family relationships when Internet addiction is a concern. A sample of 700 middle school and 500 college students in Zhuhai (a special administrative city in Southern China) were surveyed using self-report questionnaire scales to examine the links among Internet addiction, parenting style, personality traits, and interpersonal communication skills. The findings indicate that problematic parenting styles, such as strict attitudes, heavy punishment, and regularly withholding affection significantly predict individuals' Internet addiction. Dysfunctional parent–child relations can drive children to extensively use the Internet for escape. In addition, personality traits of introversion, tendency to lie, neuroticism, and psychoticism are positively associated with Internet addiction. Poor interpersonal skills are also linked to self-reported Internet addiction. This study found an interaction effect among parenting style, interpersonal relationships, and personality traits that produced a significant joint effect predicting Internet addiction. The findings provide some guidance for policy makers and professional counselors involved with youth and families struggling to treat Internet addiction.

Keywords: Internet addiction, parenting style, personality traits, interpersonal relationships, joint effect

The effects associated with extensive Internet use can be a double-edged sword. Global high-speed broadband has undoubtedly enriched people's social lives, but there are concerns about heavy Internet use and negative effects on vulnerable populations. The Internet addiction rate in the U.S. and Europe is estimated at between 1.5% and 8.2% (Fontalba-Navas, Gil-Aguilar, & Pena-Andreu, 2017; Yao, He, Ko, & Pang, 2014). In Asia, early studies reported that around 20% of adolescents perceived themselves to be addicted to the Internet (Fontalba-Navas et al., 2017). Conceptually, individuals who show evidence of Internet addiction suffer from a variety of psychosocial problems in their daily lives, such as psychological health problems, emotional behavioral problems, and problems attending to societal situations (Bozkurt,

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Coskun, Ayaydin, Adak, & Zoroglu, 2013; Dong, Hu, & Lin, 2013; John, Naumann, & Soto, 2008; Kuss, Griffiths, & Binder, 2013). The public health issue of Internet addiction is attracting attention from policy makers, health professionals, scholars, NGOs (nongovermental organizations), and families. The impetus for this research grows concern among internal and social factors and their association with Internet addiction.

In terms of social factors, heavy Internet use is associated with parenting style and parent–child relations (e.g., Niaz et al., 2005). Family plays an important role in young people's socialization. Parenting styles and parental attitudes toward children appreciably influence the psychosocial and personality development of young people (Huang et al., 2010). A number of studies report that interpersonal relationships are another factor linked to Internet addiction. Early studies found that young people could be highly dependent on Internet games (Zhong & Yao, 2013) and easily distracted when communicating with others (Del Moral Perez & Guzman Duque, 2016). Excessive online gaming significantly predicts Internet addiction (Kuss & Griffiths, 2012; Tsitsika et al., 2008). Notably, the Internet provides a platform for expanding one's social circle, making friends, and maintaining friendships (Smahel, Brown, & Blinka, 2012). Individuals who feel lonely participate fewer in social functions and use more interpersonal applications, such as instant messaging and online social media apps (Rosenbaum & Wong, 2012). Having stronger expectations that one will make friends online and have more online communication may also contribute to Internet addiction (Smahel et al., 2012).

Furthermore, internal factors such as personality traits are also associated with Internet addiction (Ko, Yen, Chen, & Chen, 2006; Ömer, Özge, Nuray, Güliz, & Fürüzan, 2014), and individuals who are inclined to overuse the Internet tend toward problematic negative motivational outcomes (Yao et al., 2014), building more multidimensional relations in the pseudo-online world than in real life (Roberts, Smith, & Pollock, 2000).

Given the broad theoretical scope and variety of studies published on Internet addiction, this study specifically focuses on the following questions: What internal and social factors influence Internet addiction? What is the relationship among parenting styles, personality traits, interpersonal relationships, and Internet addiction? By comparing two broad segments of younger Chinese people—high school and college students— this study helps us better understand the processes and effects of excessive Internet use.

Conceptualization

Internet Addiction

Internet addiction is an imprecise term that describes a constellation of Internet-related psychosocial behaviors. It has been referred to as *Internet addiction disorder* (Huang et al., 2010), *pathological Internet use* (Morahan-Martin & Schumacher, 2000), and *problematic Internet use* (Caplan, Williams, & Yee, 2009). Generally, Internet addiction is characterized as a behavioral disorder marked by poor self-control and excessive Internet use, resulting in psychological dysfunctions (Block, 2008; Gorse & Lejoyeux, 2011; Leung, Liang, & Zhang, 2017; Young, 1996). Scholars define this behavior pattern from different perspectives, such as a behavioral disorder (Gorse & Lejoyeux, 2011), an excessive person– machine interactive disorder (Young, 1996), or a non-substance-related addiction (Petry & O'Brien, 2013). Young (1998b) noted five specific aspects or areas of Internet addiction: information overload, excessive online gaming, online gambling, cyber-sexual addictive relations, and compulsive involvement with online auctions.

In particular, Kubey, Lavin, and Barrows (2001) indicated that one of the most important indicators of Internet addiction is the neglect of important functions, activities, and obligations in the person's life. This loss of control via neglect is in evidence when a person struggles to maintain ongoing Internet activities at the expense of his or her family, school work, or social obligations. Internet addiction reflects this loss of control. The individual is excessively devoted to the Internet and is unable to reduce involvement, even in the face of imminent negative repercussions (Shaffer, 2004).

Scholars have sought how to effectively explore the diagnosis of Internet addiction and found that addicts may suffer physical, psychological, social, and cognitive problems from Internet addiction (Chuang, 2006; Mehroof & Griffiths, 2010; Zhou & Li, 2009). Specifically, Internet addiction is related to negative emotions such as depression, compulsiveness, and low self-evaluation (Kim et al., 2006). Internet addicts have a high risk of being excessively preoccupied with the Internet (Cho, Kim, Lee, & Kim, 2008) and are more moody and prone to relapse (getting back online) during the course of their daily activities (Hollander & Stein, 2006).

Parenting Styles

Young people who live with their parents are subject to the rules set by their parents. These rules are enforced to maintain household routines and order. Several different types of parenting styles exist (Rhee, Lumeng, Appugliese, Kaciroti, & Bradley, 2006), and how these styles influence each member of the family is the subject of countless research studies. The common and widely used categories of parenting are authoritative, authoritarian, indulgent, and negligent (Chan & Koo, 2011; Ihmeideh & Shawareb, 2014).

Authoritative parenting expects maturity and usually takes a child-centered approach. Authoritative parents understand their children's feelings, teach them how to control their moods, and forgive their possible shortcomings. Children who have authoritative parents tend to be more secure and, therefore, independent (Rhee et al., 2006). Authoritarian parenting is associated with restriction and heavy punishment. Authoritarian parents require their children to completely follow their instructions (Sharabany, Yohanan, & Caesar, 2008). Children raised by authoritarian parents often experience depression, self-blame, and heavy adolescent rebellion (Baumrind, 1967). Indulgent parenting is also called permissive parenting. Although the approach may be well meaning, the result is often negative, leading to dysfunction. In this approach, parents try to satisfy their children's every need and wish, but seldom ask them to regulate incorrect and aggressive behaviors (Sharabany et al., 2008). Neglectful parenting is marked by a lack of responsiveness. Neglectful parents often ignore their children's emotions, requirements, and opinions (Sharabany et al., 2008). Withholding affection as well as punishment has a number of negative effects on the child's development (Baumrind, 1991; Khaleque, 2015).

Other findings regarding parenting style suggest labels such as *accepting*, *rejecting*, *indifferent*, *neglectful*, *overprotective*, and *aggressive*. For example, accepting parents may express warmth, love, affection, and support toward their children. Rejecting parents are not actively supportive of the child; instead, they withhold or withdraw their acceptance, affection, and love from their children (Sun, 2018). Indifferent parents also withhold, but it reflects a lack of concern rather than punishment. Neglectful parents fail to provide for their children's physical, psychological, and social needs (Khaleque, 2015). Overprotective parents focus too much attention on their children, resulting in children feeling smothered or overcontrolled. Aggressive parents influence their children's cognition, emotion, behavior, and interpersonal relations (Glaser, 2000). Neither indifferent nor neglectful parents are responsive to their children's needs. Individuals

who lack the close connectedness with parents may feel insecure in daily life (Hauser, 1991). Internet addiction is correlated with poor family function, single-parent family structure, and a family environment marked by conflict (Ko, Yen, Yen, Lin, & Yang, 2007; Ni, Yan, Chen, & Liu, 2009). Rejecting, neglectful, and overprotective parental styles are highly correlated with Internet addiction (Huang et al., 2010). Conversely, individuals who experience sufficient parental care and protection tend not to exhibit Internet addiction behaviors (Siomos et al., 2012).

Applying these findings from previous research on the relationships between negative parenting styles and Internet addiction, the following hypothesis is posed:

H1:   *Negative parenting styles will have higher positive correlations with Internet addiction than positive parenting styles.*

Personality Traits

Prior studies suggest that Internet addiction is often associated with personality traits (e.g., Ko et al., 2010). Among them, neuroticism has been identified as one of the primary predictors (Kuss et al., 2013; Mottram & Fleming, 2009; Yan, Li, & Sui, 2014). Neuroticism is accompanied by emotional liability and negative feelings, such as depression and jealousy (Yao et al., 2014). Individuals with high levels of neuroticism prefer to express their emotions and opinions on the Internet (Seidman, 2013) and tend to be addicted to it (Hughes, Rowe, Batey, & Lee, 2012). Studies also routinely link the trait of psychoticism with Internet addiction (e.g., Eysenck, 1997; Barlou, 2013; Ömer et al., 2014). Psychoticism is characterized by aggressive, cold, impersonal, unempathetic, and tough-minded expressions of behavior (Barlou, 2013). A personality with a high degree of psychoticism is described as having correspondingly high levels of "impulsivity, interpersonal hostility and sensation seeking" (Yao et al., 2014, p. 104).

Introversion, aggression, and poor self-regulation are related to spending excessive amounts of time playing online games (Griffiths & Dancaster, 1995; Kim, Namkoong, Ku, & Kim, 2008). Individuals with introverted personalities tend to speak less, show inward thinking, and have high levels of social anxiety, and they seldom positively comment about other people (Yao et al., 2014). In comparison with traditional media, the Internet is a welcoming environment for introverts. The anonymity and absence of social cues give them the space to build relationships and self-confidence, express themselves socially, expand their social networks, and feel as if they are gaining public support (Bargh, McKenna, & Fitzsimons, 2002; Campbell, Cumming, & Hughes, 2006; Yao et al., 2014).

Notably, previous studies have conflicting findings about the relationship between personality traits and Internet addiction. Yair, Galit, and Shaul (2004) argue that introverts like to explore self-value through the Internet. Kraut and colleagues (2002) report that introverts have more negative outcomes using the Internet. The results of the Eysenck Personality Questionnaire (Eysenck, 1997) indicate that Internet addicts report high scores on dimensions of neuroticism and psychoticism. However, some studies have not found significant links between personality traits and Internet addiction (Montag, Jurkiewicz, & Reuter, 2010; Rahmani & Lavasani, 2011).

Given these competing findings, we elaborate the conceptual model and put forth the following research question:

RQ1:   What is the relationship between personality traits and Internet addiction?

Interpersonal Relationships

Some studies confirm the relationship between Internet overuse and interpersonal social withdrawal (e.g., Flisher, 2010). The increased use of social applications contributes to the decrease in participation in real society (Bonetti, Campbell, & Gilmore, 2010; Rosenbaum & Wong, 2012). Given that good relationships with friends may enhance one's ability to adjust (Chou, 2000; Ladd & Kochenderfer, 1996) and increase self-value and esteem (Zarabatany, Conley, & Pepper, 2004), young people without close friends find it more difficult to adapt to the immediate environment, reporting higher instances of negative emotions such as depression and nervousness (Hussong, 2000; Ladd & Troop-Gordon, 2003). Poor friendships result in less interest in social events and greater involvement with online activities (Sun, 2018).

Young people need to build close relationships with peers and friends (Erikson, 1968). Instead of suffering silently through the social problems encountered in daily life, some find that the Internet can facilitate meeting others, sharing interests, and enjoying an expanded social life (Smahel et al., 2012). Because the Internet is not face-to-face, the resulting blurring of boundaries is problematic because individuals' receptivity to making online friends is also associated with Internet addiction (Smahel et al., 2012). In this case, it's not that making friends is bad; the danger is mistakenly believing that Internet friendships are just as committed and deep as those built face-to-face.

Previous studies have found that parenting style and parent–child relationships impact young people's psychosocial health and interpersonal relationships (Conger, Cui, Elder, & Bryant, 2000; Huang et al., 2010; Odenweller, Booth-Butterfield, & Weber, 2014). Individuals who psychologically rely on their parents encounter challenges in the subsequent development of competent friendships with others (Cook & Fletcher, 2012). High parental control is associated with negative outcomes for children, such as weak self-concepts and social incompetency (Orrego & Rodriguez, 2001). A strict parenting style might motivate people to look for alternative self-image and social interactions via the Internet (Valcke, Bonte, De Wever, & Rots, 2010). When parents fail to offer a warm and positive social environment, individuals with negative emotions are inclined to form cognitive styles in favor of online behaviors and lack necessary social activities (Zhang, Li, & Li, 2015). In contrast, positive parenting and parent–child relations are significantly associated with positive adult interpersonal relationships (Dalton, Frick-Horbury, & Kitzmann, 2006). Friendship is closely linked with efficient communication ability (James & Mazer, 2012). Prior studies provide clear direction when considering the relationships between parenting styles and skill in building interpersonal relationships. Thus, it may be reasoned that parenting style impacts a child's ability to form interpersonal relationships. A negative style can erode a young person's ability to form these relationships, and a positive style can enhance these abilities. Therefore, the following hypotheses are proposed in this survey of Chinese teens and young adults:

H2:   Weak interpersonal relationships will have higher positive correlations with Internet addiction than strong interpersonal relationships.

H3:   Among those who score high on Internet addiction, interpersonal relationships will moderate the link between parenting style and Internet addiction.

Existing studies have found that parental values and family dynamics have a long-term impact on individuals' personality development (Ferguson, 2002). Negative personality traits are related to environmental factors that include parenting styles and family communication (Pluess, Belsky, Way, & Taylor, 2010). For example, children may feel anxious and depressed when their parents cannot perform one task on their behalf (Brown & Rosellini, 2011). Children's and youths' personality formation is influenced by parents' leadership styles (Dreikurs, Cassel, & Ferguson, 2004). Parenting styles are significantly related to young adults' emotional adjustment, especially during early adulthood (McKinney & Renk, 2008). Emotions such as self-esteem, depression, and anxiety are closely associated with personality. Based on the previous logical argumentation, the following research question is raised:

RQ2:   *What is the relationship between parenting style and personality traits? Are there parenting styles that predict personality traits? Do personality traits mediate the relationship between parenting style and Internet addiction?*

Method

Sample and Sampling Procedure

Data for this study were collected in 2015. A total of 1,200 young people—500 college students and 700 middle school students in Zhuhai, a large city in southern China—were selected through purposive sampling methods and asked to respond to a self-report questionnaire given to them in school. A total of 1,123 valid questionnaires were collected that could be used in the statistical analysis—a response rate of 90%. Slightly more than half (54%) of the respondents were female, and 46% were male. Among college students, a total of 76.2% of the respondents were between 18 and 20 years old, and the rest were between 21 and 25 years old (23.8%). For middle school students, a total of 72.7% of the interviewees were between 16 and 18 years old, and the rest were between 12 and 15 years old (27.3%). The unmarried college students occupied a much larger percentage than the married students: 94.2% and 5.8%, respectively. See Tables 1 and 2.

Table 1. Summary Sample (Middle School) Statistics of Demographics.

Demographics	%
Gender	
Male	48.5
Female	51.5
Age	
12–15	27.3
16–18	72.7
Education	
Senior school	97
Middle school	3
Family Annual Income (CNY)	
Below 40,000 (include 40,000)	25
40,001–80,000 (include 80,000)	25.8
80,001–120,000 (include 120,000)	19.9

120,001–160,000 (include 160,000)	13.7
160,001–200,000 (include 200,000)	5
Above 200,000	10.6

Note. N = 695.

Table 2. Summary Sample (College) Statistics of Demographics.

Demographics	%
Gender	
Male	42.5
Female	57.5
Age	
18–20	76.2
21–25	23.8
Education	
College	97.4
Graduate and above	2.6
Family Annual Income (CNY)	
Below 40,000 (include 40,000)	20.3
40,001–80,000 (include 80,000)	19.4
80,001–120,000 (include 120,000)	24.5
120,001–160,000 (include 160,000)	12.9
160,001–200,000 (include 200,000)	6.3
Above 200,000	16.6
Marital Status	
Unmarried	94.2
Married	5.8

Note. N = 428.

Measurements

Internet addiction was measured using 17 4-point Likert-scale items (1 = *never* and 4 = *always*) developed from Kimberly (2009) and Young (1998a). The sample questions are: (1) "I often find myself staying longer on the Internet than I planned to"; (2) "I often neglect my work and spend more time on the Internet"; (3) "I would like to stay online rather than spend time with friends"; and (4) "My life will be boring without (website)." A low score (below 40) indicated no Internet addiction, a moderate score (between 40 and 70) indicated a light addiction, and a score above 70 indicated a heavy addiction (Kimberly, 2009). A principal component factor analysis with oblimin rotation generated a single factor (eigenvalue > 1), which was labeled Internet Addiction (see Appendix A) and used in subsequent analyses. A reliability analysis of the 17 items confirmed the single factor (Cronbach's a = .89).

Parenting style was measured with 16 items developed from Perris, Jacobsson, Lindstrom, Knorring, and Perris (1980) using 4-point Likert-scale items (1 = *never* and 4 = *always*). The sample items were: (1) "In my childhood, my parents used to beat me in front of others"; (2) "I will get support from

parents when I meet difficulties"; (3) "My parents always care about what I usually do at night"; and (4) "My parents always think that their unhappiness is caused by me." Principal component factor analysis using oblimin rotation produced six identifiable factors (eigenvalue > 1). The six factors were labeled as understand, punishment, interference, preference, rejecting, and overprotection (see Appendix B). The six factors accounted for 67.7% of the total variance.

For personality traits measurement, 17 items were developed from Eysenck's theory (Eysenck & Eysenck, 1985) using a 2-point Likert scale (0 = No; 1 = Yes). Sample questions included: (1) "Do you have many hobbies?," (2) "Are you a talkative person?," and (3) "Do you make new friends on your own initiative?" An exploratory factor analysis of the 17 items resulted in four clean factors in accordance with the conceptualized distinctions among psychoticism, introversion, being a liar, and neuroticism. Together, the four factors accounted for 42.03% of the total variance (see Appendix C).

Interpersonal relationships was measured using eleven 2-point Likert-scale items (0 = No and 1 = Yes) developed from Zheng (1999). The sample items are: (1) "I can't get along well with others"; (2) "I cannot concentrate on listening"; (3) "I worry that other people have a bad impression of me"; and (4) "I often avoid expressing my own opinions." A principal component factor analysis using oblimin rotation yielded two single factors (eigenvalue > 1), which were labeled personal factor and relational factor (see Appendix D).

Demographic variables included gender (1 = male; 2 = female), age (measured in two-year increments), education (ordinal measures for middle school, high school, college undergraduate, and graduate or above), annual household income (from all members of the family), and marital status (1 = unmarried; 2 = married).

Results

Results of H1, RQ1, and H2

Across demographics, males are, as expected, significantly more likely than females to experience Internet addiction disorder ($\beta = -.18$; $p < .001$), consistent with previous findings (see Chou, Condron, & Belland, 2005; Cuhadar, 2012; Ko et al., 2010; Mottram & Fleming, 2009; Tsai et al., 2009; Yen, Ko, Yen, Chen, & Chen, 2009). Intuitive as this particular finding is, absent is a significant prediction from the rest of the three demographic attributes: age, education, and family income. Given that all respondents belonged to younger age groups (no older than 25 years), age was not a significant predictor in this study.

Regression analyses were performed to test the predictive power of parenting style, personality traits, and interpersonal relationships for Internet addiction. Controlling for demographics, results showed that parenting style was the strongest predictor ($R^2 = 21.1\%$). The rejecting style was highly associated with Internet addiction ($\beta = .254$, $p < .001$). Individuals whose parents often criticize or reject them may be more likely to be involved in the Internet world. The punishment factor was another significant predictor ($\beta = .130$, $p < .001$). Under parents' strict treatment and punishment, young people will be more likely to avoid this type of interaction by remaining online as much as possible. The other two factors, preference and overprotection, were negatively correlated with Internet addiction ($\beta_{preference} = -.139$; $p < .001$; $\beta_{overprotection} = -.124$; $p < .01$). That is, individuals who are not favored or well protected by parents are found to have more Internet disorder behaviors. On the other hand, young people whose parents regularly engage

with their daily activities are found not to have Internet addictions. These results echoed each other: Young people were less prone to Internet addiction when they perceived that their parents paid enough attention to them. Based on the results in this study, Hypothesis 1 was fully supported.

When it comes to personality traits, two of the four summary types (factors) were significantly related to Internet addiction. Being a liar was nearly fully equivalent to mental or behavioral commitment to the Internet and produced the strongest beta ($\beta = .206$; $p < .001$). Introversion was another strong Internet addiction indicator ($\beta = .196$; $p < .01$). Psychoticism and neuroticism were negatively related to Internet addiction ($\beta_{psychoticism} = -.186$; $p < .001$; $\beta_{neuroticism} = -.113$; $p < .01$).

Regarding dimensions of interpersonal relationships, the results showed that both relational and personal factors carried significant but negative weightings in the Chinese culture in connection with Internet addiction ($\beta_{relational} = -.178$; $p < .001$; $\beta_{personal} = -.196$; $p < .001$). Having poor relationships and being uncomfortable communicating with others were associated with online addictive behavior. As a result, Hypothesis 2 was fully supported. Personality traits and interpersonal relationships were found to be strong predictors of Internet addiction. For details, see Table 3.

Table 3. Predicting Internet Addiction.

Demographics			
Gender			−.177***
Age			.000
Education		.003	
Income		−.004	
R^2 (%)			3.10***
Adjusted R^2 (%)			2.60***
Parenting Styles			
Rejecting			.254***
Preference			−.139***
Overprotection		−.124**	
Punishment			.130**
Interference			−.031
Understand			−.072
R^2 (%)			21.10***
Adjusted R^2 (%)			19.90***
Personality Traits			
Psychoticism			−.186***
Introversion			.196***
Lie			.206***
Neuroticism		−.113**	
R^2 (%)			16.00***
Adjusted R^2 (%)			15.00***
Interpersonal Relationships			
Relational factor			−.178***

Personal factor	−.196***
R^2 (%)	9.90***
Adjusted R^2 (%)	9.10***

Note. Entries are standardized OLS regression beta coefficients (N = 1,123). All figures controlled for demographics. p < .10. *p < .05. **p < .01. ***p < .001.

Result of H3 (Moderation Effect)

A multiple regression model was used to investigate whether the association between parenting style and Internet addiction depends on the two aspects of interpersonal relationships (relational and personal factor). After doing centering, an interaction term was created by multiplying the rejecting, preference, overprotection, and punishment component of the parenting styles with two interpersonal relationships factors, respectively. Therefore, parenting style, interpersonal relationships, and the interaction were entered into the regression model (see Table 4).

Table 4. OLS Regression: Joint Effect of Parenting Style and Interpersonal Relationships on Internet Addiction.

Demographics		
R^2 (%)		3.10***
Adjusted R^2 (%)		2.60***
Interpersonal Relationships		
Relational factor		−.178***
Personal factor		−.196***
R^2 (%)		9.90***
Adjusted R^2 (%)		9.10***
Parenting Style		
R^2 (%)		21.10***
Adjusted R^2 (%)		19.90***
Interaction Term		
cReject* cRelational		−.222***
cReject*cPersonal	.089*	
R^2 (%)		8.90***
Adjusted R^2 (%)		8.10***
cUnderstand*cRelational		−.132**
cUnderstand*cPersonal		.038
R^2 (%)		5.00***
Adjusted R^2 (%)		4.20***
cPreference*cRelational		−.110**
cPreference*cPersonal		.096
	*	
R^2 (%)		5.30***
Adjusted R^2 (%)		4.50***

cInterfere*cRelational		−.217***
cInterfere*cPersonal		.067
R^2 (%)		8.40***
Adjusted R^2 (%)		7.60***
cProtection*cRelational		−.207***
cProtection*cPersonal	.091*	
R^2 (%)		8.20***
Adjusted R^2 (%)		7.40***
cPunish*cRelational		−.221***
cPunish*cPersonal	.104**	
R^2 (%)		9.20***
Adjusted R^2 (%)		8.40***

Note. Entries are standardized OLS regression beta coefficients (N = 1,123). All figures controlled for demographics. $p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Regression analysis betas controlling for demographics for the eight interaction terms were identical (β = −.222, $p < .001$ for rejecting and relational factor; β = .089, $p < .05$ for rejecting and personal factor; β = −.110, $p < .01$ for preference and relational factor; β = .096, $p < .05$ for preference and personal factor; β = −.207, $p < .001$ for overprotection and relational factor; β = .091, $p < .05$ for overprotection and personal factor; β = −.221, $p < .001$ for punishment and relational factor; β = .104, $p < .01$ for punishment and personal factor; β = −.217, $p < .001$ for interference and relational factor; and β = −.132, $p < .01$ for understand and relational factor), suggesting that the effect of parenting style on Internet addiction depended on the two interpersonal relationship factors. Hypothesis 3 was fully supported.

The findings have the following implications: (1) Internet addiction is evidenced by those who often face rejection by their parents and encounter more difficulty and lower self-assessment in communicating with others; (2) feeling unloved by one's parents makes individuals feel unworthy and is linked to problems communicating with others; (3) Internet addiction for those who feel smothered and overprotected by their parents is linked to greater difficulties with interpersonal relationships; and (4) experiencing routine punishment from parents leads to a lack of self-confidence and the active search to feel better through online activity. The following moderation effect model (Figure 1) was established:
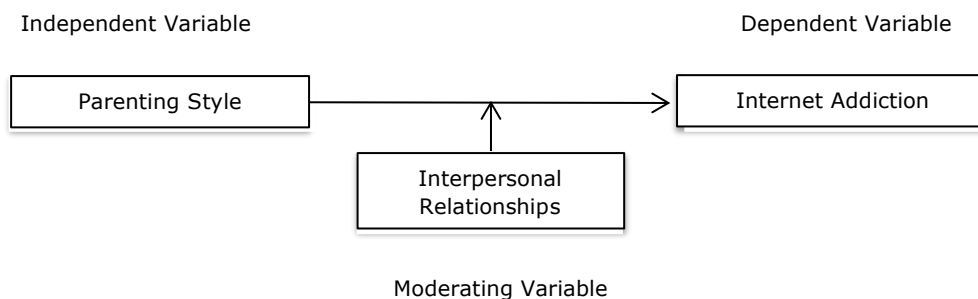

Figure 1. Moderation effect.

Result of RQ2 (Mediation Effect)

This research question addressed whether personality traits mediate the relationship between parenting style and Internet addiction. Responses from the personality questions were used as the mediator in the several regression analyses. Demographics were controlled in all analyses. Because it was needed to test for mediation (Baron & Kenny, 1986), the parenting styles of rejecting, preference, and overprotection were found to be significant predictors of personality traits. Specifically, rejecting negatively predicted both psychoticism ($\beta = -.11$, $p < .01$) and neuroticism ($\beta = -.15$, $p < .001$); preference positively predicted introversion ($\beta = .08$, $p < .05$), while overprotection produced a negative association ($\beta = -.09$, $p < .05$).

Personality traits were significant predictors of Internet addiction ($\beta = -.19$, $p < .001$ for psychoticism; $\beta = .20$, $p < .001$ for introversion; $\beta = .21$, $p < .001$ for being a liar; $\beta = -.11$, $p < .01$ for neuroticism). After personality traits were entered into the model, the effect of the two parenting styles was reduced (from $\beta = .25$, $p < .001$ to $\beta = .21$, $p < .001$ for rejecting; from $\beta = -.14$, $p < .001$ to $\beta = -.15$, $p < .001$ for preference). However, the reduction effects were still significant. Personality traits were found to partially mediate the relationships between two parenting styles (rejecting and preference) and Internet addiction. In other words, two parenting styles act on Internet addiction partly through personality traits. The partial mediation model can be proposed in the following model (Figure 2):
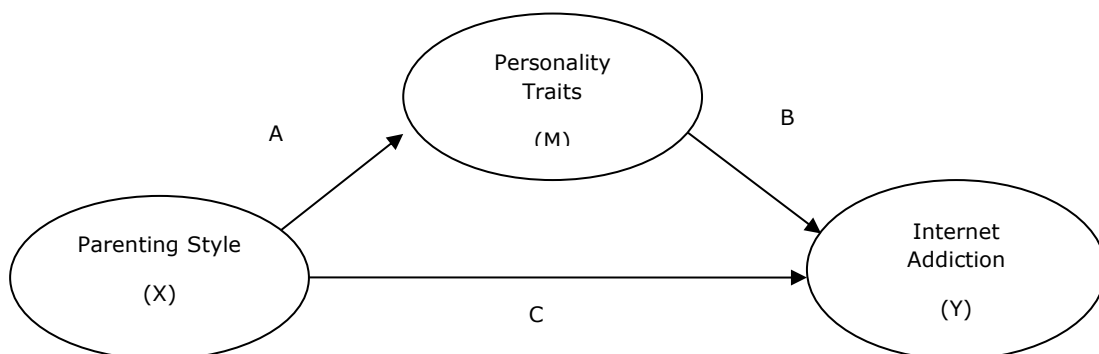

Figure 2. Partial mediation model.

Conclusion and Discussion

A clear pattern emerged from the data analyses: Internet addiction is interwoven with parenting style, personality traits, and interpersonal relationships. As the strongest predictor, parenting styles such as rigorous and severe are closely associated with Internet addiction. Individuals with parents who are overly strict, who often use punishment, and who reject their emotional needs may be more susceptible to Internet addiction. They use the Internet as an escape, a new channel to look for friends and release

pressure. The results indicate that the closer the parent–child relationship, the less likely it is that a young person will suffer from Internet addiction disorder.

The findings reiterate that there is a relationship between personality traits (i.e., introversion) and Internet addiction. This study found that personality traits, such as being a liar and being introverted, are positively correlated with Internet addiction. Meanwhile, psychoticism and neuroticism are negatively related to Internet addiction. The findings are consistent with earlier studies (e.g., Roberts et al., 2000) and support the view that personality traits can predict Internet addiction.

This study also shows the clear correlation between poor interpersonal relationships and Internet addiction. Internet addicts often feel uneasy communicating with other people and tend to distance themselves from others in society. The findings show that the better one can relate to peers and friends, the lower the likelihood that the person will be addicted to the Internet. Inversely, the more difficulty one has making friends or communicating with others, the greater the chance that the person will cope by looking for release on the Internet.

Theoretical Implications

Developing Theoretical Instructed Measurement

This study further develops the two dimensions of interpersonal relationships reported in previous studies (Zheng, 1999). The relational factor focuses on the weak points of communication, while the personal factor expresses the feelings of self-abasement or low self-esteem. Both factors suggest that there are incompatible situations regarding how we evaluate ourselves and our communication with others.

Developing Theoretical Effect Models

Based on the findings in this study, Internet addiction is the result of not only individual factors, but also variables involving interpersonal skills, home life, and parenting style. As expected, interpersonal relationships moderate the effect of parenting style on Internet addiction. Individuals who are often rejected, less protected, neglected, and punished by their parents are more likely to show online addiction behaviors. The degree of addiction is related to the individual's skill at building interpersonal relationships. Individuals who have more difficulties with communication and less self-confidence are highly inclined to exhibit online addiction behaviors.

The results of this study suggest several significant theoretical implications: Attention should be focused on the interaction effects involving personality traits, parenting styles, and Internet addiction. Personality traits partially mediate the effect of parenting style on Internet addiction. People with problematic parent–child relations experience greater dissatisfaction and negative mood related to personality traits and show more involvement in Internet activities.

The study is subject to some limitations, which stem from relatively outdated measures of Internet addiction. For example, the original study by Young (1998b) included gambling online, which is less problematic today. Similarly, mobile smartphones are the device of choice for most young people, following their widespread adoption. Original conceptions of Internet addiction reflected the use of desktop computers

in the home or at Internet cafes. Still, the Internet addiction instrument is relatively stable and internally reliable, as are the measures of parenting style, personality, and perceptions about interpersonal relationships.

The core findings of this study are useful to scholars and policy makers alike. Excessive dysfunctional Internet activity is related to the household environment. To further address possible solutions, future studies may consider (1) developing original scales or using updated measurement vehicles for the constructs central to this study and (2) testing the mediated moderation effect or moderated mediation effect among the four variables. The proposed theoretical model can help identify key aspects of the possible hybrid effects in youth, family research, and new media studies.

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Appendices

Appendix A

Factor Analysis (Principal Component With Oblimin Rotation) on Internet Addiction

	Internet Addiction
I often find myself staying longer on the Internet than I planned to.	.601
I often neglect my work and spend more time on the Internet.	.655
I would like to stay online rather than spend time with friends.	.607
Other people always complain that I spend too much time on the Internet.	.668
I spend a lot of time on the Internet, which affects my homework and school record.	.580
I try to find an excuse when someone asks what I am doing on the Internet.	.518
I use the Internet to distract myself from my real-life troubles.	.550
I am always interested in surfing the Internet.	.539
My life will be boring without the Internet.	.564
I will become angry if someone bothers me when I use the Internet.	.590
I don't get enough sleep because I surf online late.	.619
I am often lost in thought, and imagine that I am surfing the Internet.	.660
When I use the Internet, I tell myself that I will just play for a few minutes.	.652
I often try to cut down on the time I spend online, but I fail to do it.	.641
I try to hide how much time I spend on the Internet.	.615
I would like to stay on the Internet rather than go outside with family or friends.	.639
I feel depressed offline and feel good online.	.620
Variance accounted for (%)	37.03

Note. N = 1,123.

Appendix B

Factor Analysis (Principal Component With Oblimin Rotation) on Parenting Styles

	U Style	Pu Style	Int Style	Pre Style	Re Style	Pro Style
I think that my parents respect and tolerate my different opinion.	.80					
I will get support from parents when I meet difficulties.	.79					
My parents will be proud of me when I succeed.	.77					

	U	Pu	Int	Pre	Re	Pro
My parents' punishment is fair and appropriate.	.75					
My parents will punish me even though it is a small mistake.		.74				
In my childhood, my parents used to beat me in front of others.		.74				
I was very embarrassed when my parents told others what I said or did.		.52				
My parents always care about what I usually do at night.			−.84			
My parents pay a lot of attention to what friends I make.			−.67			
Compared to other family members, my parents love me more.				−.87		
My parents give me something that others cannot get.				−.77		
My parents always think that their unhappiness is caused by me.					.55	
My parents often say, "Is this the reward for us working hard for you?"					.76	
I will feel guilty if I don't listen to my parents.					.86	
My parents always over-worry about my health.						−.78
I think that my parents over-worry about my safety.						−.68
Variance accounted for (%)	19.27	5.00	5.76	6.50	25.68	5.45

Note. N = 1,123. U = understand; Pu = punishment; Int = interference; Pre = preference; Re = rejecting; Pro = overprotection.

Appendix C

Factor Analysis (Principal Component With Oblimin Rotation) on Personality Traits

	Psy	Intro	Liar	Neu
Other people tell lots of lies to you.	.65			
Your friendship is easily broken, although it is not your fault.	.61			
You want other people to be afraid of you.	.60			
You have deliberately used some words to hurt others' feelings.	.56			
You hate people who drive carefully.	.46			
You are talkative.		.68		
You usually enjoy yourself at a party.		.67		

	Psy	Intro	Liar	Neu
You usually take the initiative to make new friends.		.63		
You have many hobbies.		.51		
You like meeting strangers.		.48		
You apologize for being rude.			.70	
You often admit your mistakes.			.67	
You must wash your hands before eating.			.52	
Your emotions are not stable.				.74
You are an anxious person.				.61
You are often nervous about what you shouldn't do or say.				.59
You get angry easily toward something.				.58
Variance accounted for (%)	14.18	11.83	9.06	6.96

Note. *N* = 1,123. Psy = psychoticism; Intro = introversion; Liar = being a Liar; Neu = neuroticism.

Appendix D

Factor Analysis (Principal Component With Oblimin Rotation) on Interpersonal Relationships

	Relational Factor	Personal Factor
I can't get along well with others.	.73	
I look down on the opposite sex.	.71	
I am excluded from others and meet indifference.	.65	
I cannot concentrate on listening.	.53	
I often feel lonely even though I have many friends.	.52	
I worry that other people have a bad impression of me.		.70
I feel nervous on social occasions.		.69
I often avoid expressing my own opinions.		.61
I am not confident about my appearance.		.59
I don't know how to interact with males/females.		.50
I often envy others.		.42
Variance accounted for (%)	28.56	12.78

Note. *N* = 1,123.