

Parents vs Peers' Influence on teenagers' Internet Addiction and Risky Online Activities

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Abstract

An integral part of the daily lives of adolescents revolves around the Internet. Adolescents are vulnerable online because of a combination of their natural innocence, sensation-seeking drive coupled with the current digital media landscape and its manifold affordances for interactivity, immersive virtual environments and social networking. Adolescence is a time of transition in which youths progressively venture from the safety of the home to explore new opportunities. In this phase of life, both parents and peers play a critical role in either instigating or mitigating risky and dangerous activities. This study examines in the context of youth's online risky activities, whether the compensatory-competition model or the continuity-cognitive model prevails. This study also explores whether the engagement of parental mediation activities mitigates or compounds the situation.

A Partial Least Square Equation analysis of a stratified random survey of 2,000 Malaysian school children between 13-15-year-old controlling for age and gender, found that peer-attachment competes with parent attachment for the influence of teenagers' risky online activities and Internet addiction. Parental influence is stronger when parents actively engage in mediating the online activities of their teenagers. On balance, parents can have more influence on teenagers than their peers.

Keywords: Internet addiction, Risky online activities, Parent attachment, Peer attachment, Parental mediation, Malaysia

1.0 Introduction

Malaysians are adopting the Internet rapidly. This earnestness is driven by the belief that the Internet is particularly important for education and upward mobility. Malaysia enjoys a high Internet penetration rate at 77.6% (Malaysian Communications and Multimedia Commission, 2016). Some 90% of urban Malaysian school children have access to the Internet (Soh, et al., 2014). Compared with others in Malaysia, school children spend the most time online, averaging three hours online daily (Malaysian Communications and Multimedia Commission, 2016). In Malaysia, the Internet is widely available in schools, public libraries, cybercafés and especially through mobile phones.

Strong parental control is a key cultural trait of many Asian societies including Malaysia (Chen et al., 2007). The Malaysia population predominantly composed of three ethnic groups- Malays, Chinese and Indians. For all three groups, filial piety is a core principle in the Malaysian family system (Ismail et al., 2009). As no systematic study of parental guidance of children's media usage has been conducted in Malaysia, this study seeks to explore the influences of parents and peers on youths' risky online activities and Internet addiction. The study is particularly relevant to the Asian context because filial piety and strong parental control are common traits in Asian families.

2.0 Literature Review

With the Internet becoming pervasive and integrated into the lives of youths, parents are aware that youths can be vulnerable to online dangers as well as be overly engrossed with online activities to the detriment of their holistic development. Online anonymity allows strangers to have access to youths in the seeming security of their homes. In an investigative report in Malaysia, a group of young reporters went undercover pretending to be 15-year-old kids using mobile online social applications. Strangers approached them and attempted to sexually groom them, arranged face-to-face meetings and persuaded to have sex or to check in a hotel room (The Star, 2017). All over the world, youths are vulnerable online. For instance, in the United States, a survey reported that 40% youths chatted or connected online with a stranger (Center for Cyber Safety and Education, 2016).

In addition to online risky activities, youths are also susceptible to addiction to the Internet (Young, 2004; Soh et al., 2014). Internet addiction describes the concept that an individual could be too engrossed in their online activities that their well-being is neglected (Widyanto and Griffiths, 2006). There appears to be compelling empirical evidence of Internet addiction (Widyanto and Griffiths, 2006) with the consequences of the addiction including depression, neglect of work, poor grades, sleep deprivation and loneliness (Young, 2004).

Parents and peers are the primary influences on the lives of children. They mold or hinder the development and identity of the child; they create the rules and an environment for their child to be

classically conditioned (Bowlby, 1982). Close relationships with parents are significant predictors of self-esteem, life-satisfaction and positive attitudes (Armsden and Greenberg, 1987; Wilkinson and Kraljevic, 2004). Many studies have also consistently reported friendship to be instrumental for the psychological health and adjustment in adolescence (Armsden and Greenberg, 1987; Wilkinson and Kraljevic, 2004).

While there is a common understanding that both parental and peer attachment play important roles in the lives of adolescents, the empirical evidence is inconclusive on how parents and peers influence youths, and who has more influence (Wilkinson, 2004; Steinberg, 2001). For example, conflicting models have emerged regarding whether friends compete with or complement the influence of parents. The compensatory–competition model argues that adolescents seek approval from their peers in order to compensate for unfulfilled needs in the parental/family environment and so peers compete for influence with parents (Cooper and Ayers-Lopez, 1985; Cooper et al., 1998). For example, some youths are reported to be influenced by their peers towards anti-social activities such as smoking, drinking, pornography and addiction (Nickerson and Nagle, 2005). Hence, relationship with parents can exist in tension with friendship with peers (Wilkinson, 2004).

On the other hand, the continuity-cognitive model proposes that the form and quality of peer friendships is an extension of the form and quality of relationship that has developed from the parent-child (Bowlby, 1982; Wilkinson, 2004). In other words, rather than being in competition, peers and parents relations are interrelated and complementary of each other. For example, peer influence has been reported to have a positive effect on school grades (Crosnoe et al., 2003).

This study seeks to determine in the arena of online world, whether the compensatory-competition model or the continuity-cognitive model holds sway over adolescents, as well as whether parents or peers hold more influence. In addition, this study also explores whether parental engagement of the mediation of youths' online activities significantly reduces the propensity for Internet addiction and risky online activities.

Malaysia is an appropriate location for this study, in part because of the pervasive use of the Internet among its adolescents and the nation's aggressive push for Internet connectedness (Malaysian Communications and Multimedia Commission, 2016), alongside evidence of parental concerns about the adverse impact of the Internet upon children (Soh et al., 2014).

3.0 Hypotheses development

3.1 Parent-Child Attachment

Parent-child attachment refers to a specific aspect of the relationship between a child and a parent with its purpose being to make a child safe, secure and protected. Such an attachment is a deep and enduring emotional bond across time and space (Ainsworth, 1973; Bowlby, 1982). According to

attachment theory, children bond with parents in their early formative years and this relationship shapes their underlying patterns of thoughts, feelings, and motivations in their future adulthood (Bowlby, 1982). Attachment is different from other aspects of parenting, such as disciplining, entertaining and teaching (Beniot, 2004). Adolescence presents a challenge; maintaining relationship with parents while exploring new opportunities and developing attachment relationships with peers and possibly romantic partners (Moretti and Holland, 2003). It is important to note that successful transition of the adolescence phase is not achieved through detachment from parents (Lamborn, 1993); healthy transition to autonomy and adulthood is facilitated by secure attachment and emotional closeness with parents (Ryan and Lynch, 1989).

In a nutshell, research shows that attachment security in adolescence exerts the same effect on development as it does in early childhood: a secure base fosters exploration and healthy self-development (Allen et al., 2003). Evidence of the positive impact of parent attachment on adolescent development is indisputable and immense (Moretti and Peled, 2004). A review of the past 25 years of research in adolescent development concludes that students with close ties to parents achieved more in schools, have higher self-reliance and self-esteem (Steinberg, 2001). Conversely, adolescents' parent attachment security is inversely correlated with antisocial behavior such as delinquency, alcohol use and drug abuse (Claes et al., 2005).

Similar influence has been observed for Internet addiction and risky online behavior. Weak parental-attachment was reported to be a risk factor for children's risky online activities (Lei and Wu, 2007; Yang et al., 2016) and internet addiction (Soh et al., 2014). Close parent-child relationship negatively predicted adolescents' risky online activities (Deng et al., 2013). A survey of 2,578 junior high school students in China, after controlling for gender, age, and socioeconomic status, found that close parent-child attachment had a negative relationship with adolescent problematic Internet use (Chen et al., 2015). Hence, the following hypotheses are postulated:

H1a: Strong parent-child attachment is negatively related with youths' Internet addiction.

H1b: Strong parent-child attachment is negatively related with youths' engagement with risky online activities.

3.2 Attachment to Peers

Peers are particularly important to adolescents (Armsden and Greenberg, 1987) because adolescents are in a transitory period when they (adolescents) gravitate more toward friends and less towards parents (Cooper et al., 1998). Given that adolescents want to fit in with their peers, they are also sensitive to influences from their friends. Peers are reported to be more influential than parents in affecting sexual behavior (Debarun, 2003), viewing antisocial television programs (Nathanson, 2001),

and indulging in antisocial video games (Dalessandro and Chory-Assad, 2006). When it comes to deviant behavior such as theft, vandalism, violent behavior, alcohol use, or drug use, the consensus is that peers play a more dominant role than parents (Aseltine, 1995; Cheung, 1997; Patterson et al., 2000).

In media use, friends usually play a completely different role from that of parents. Whereas parents usually try to restrict risky media behavior and inspire critical thinking about media, friends may leverage media in order to test the boundaries of acceptable behavior. Social norms theory suggests that peer influence adolescents' involvement in risky behavior (Berkowitz, 2005). Lam and Chan (2007) found in their study of 229 young Chinese men in Hong Kong that online pornography viewing was strongly correlated with peer influence and pressure. In another study, peer-attachment was found to correlate positively with Internet addiction through entertainment and social-interaction motivations (Soh et al., 2014). However, there are also findings that low peer-attachment encouraged cyber pornography and Internet addiction (Yang et al., 2016). Davies (2007), in a study of 244 American college students, found that weak attachment to peers and parents predicted greater consumption of sexual media. For the purpose of this research, the following hypotheses are formulated:

H2a: Peer-attachment is positively related with Internet addiction.

H2b: Peer-attachment is positively related with engagement with risky online activities.

3.3 Parental Mediation

Parental mediation refers to the engagement of strategies and activities used by parents to increase the benefits and mitigate the risks (potential negative impacts) of media influence (Kirwil, 2009). Parents play a critical role in monitoring children's activities. As children have woven the Internet into the fabric of their social lives, parental knowledge requires learning about the children's online activities. To mediate effectively in the online space, parents use various strategies that differentially affect the involvement of children in deviant and risky behavior online (Stattin and Kerr, 2000). Kerr and Stattin (2000) differentiated three potential sources of parental knowledge about their children's activities, namely control, solicitation and disclosure. Control refers to parents controlling their children's activities and whereabouts by using rules and restrictions. Solicitation is when parents actively ask their children and the children's friends and teachers about their whereabouts. Thus, control and solicitation can be considered as monitoring activities. Disclosure, in contrast, applies to children's voluntariness to share information with their parents and is related to the degree of family cohesion. While parental control and monitoring have not been found to reduce online risks behavior of youths, disclosure has been reported to be negatively associated with youngsters' breaking norms and risky online activities (Kerr and Stattin, 2000). For example, a study of 733 adolescents aged 10-18 found that the more often adolescents disclose to their parents about their online activities, the fewer aggressive messages they sent online (Law et al.,

2010). The effects of the parenting style of control and solicitation, however, are not consistent across studies (Kerr and Stattin, 2010; Stattin & Kerr, 2000, Law et al., 2010).

Research on parental mediation of children's media use started from television viewing. Nathanson (2001, 2008) drew together the research literature by proposing three broad strategies of parental regulation, namely active, restrictive, and co-viewing mediation. For the Internet, Livingstone and Helsper (2008) defined four parental mediation styles namely active, co-use, monitoring and restrictions. As Jiow et al. (2016) pointed out, however, parents tend not to use any particular parental mediation strategy in isolation but engage in a concurrent application of multiple mediation strategies that are appropriately applied to the circumstances. Hence, in this study parental mediation is measured as an all-encompassing construct that includes active, co-use, monitoring and restrictions in this study. Parents who are close to their children would likely be more actively involved in their children's lives including their online activities (Cai et al., 2013). It is postulated that:

H3: Parent-child attachment is positively related with parents' mediation of their children online activities.

For all the advice on parental mediation in children online activities, the effectiveness of such mediation has not been conclusively proven. On the one hand, some studies found that family rules reduce the propensity of youths to engage with risky online activities and addiction to the Internet (Guo and Nathanson, 2011; Lee, 2013; Chang et al., 2015). Yet, other research suggests that parental mediation is ineffective (Lee and Chae, 2007; Livingstone and Helsper, 2008). Specifically, restrictive parental supervision, which is a specific parenting style was reported to actually increased adolescents' risky online activities (Sasson and Mesch, 2014). Notwithstanding the lack of consensus but for the purpose of this study, we postulate that the following hypotheses:

H4a: Parental mediation is negatively related with youths' Internet addiction.

H4b: Parental mediation is negatively related with youths' risky online activities.

3.4 Control Variables

Studies indicate that gender and age are important variables associated with Internet addiction and risky online activities (Lemish et al., 2009). Males and younger people are more prone to Internet addiction and risky online activities. Hence, this study controlled for gender and age. The proposed model and hypotheses to be tested are summarized in Figure 1 below.

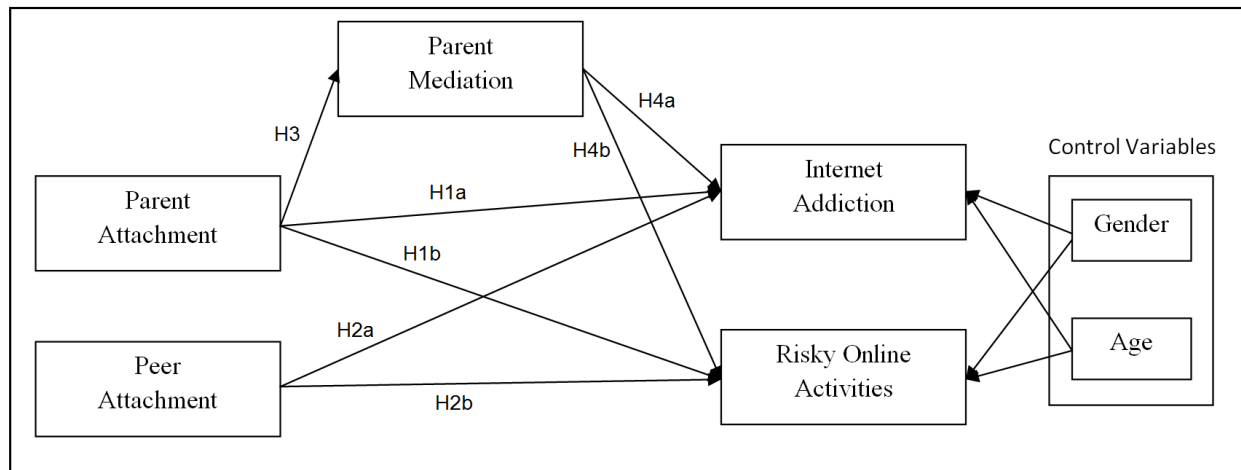


Fig. 1 Proposed Model

4.0 Procedure

4.1 Instruments

The cross-sectional survey consisted of a single paper booklet asking for demographic details (such as age, gender, race) and five measurement scales, namely parental mediation, parent and peer-attachment, Internet addiction, and risky online activities. All five scales were adapted from previous studies and involved five-point Likert scale responses (strongly disagree to strongly agree), responses being numerically recoded (1–5) to produce high scores indicating more of the construct expressed by scale labels. The scores of negative items were reversed. The five scales were refined and validated in three pilot studies. Details of the items in the scales are provided in Appendix 1.

Internet Addiction

Internet addiction, also called problematic Internet use, refers to excessive Internet use that interferes with daily life. There are several Internet addiction scales available in the literature. This study adopted the Internet addiction scale developed and validated by Charlton and Danforth (2007, 2010), with a total of 11 questions to measure the construct of internet addiction. It was derived from factor analytic studies that explicitly distinguish addictions from (non-pathological) high engagement.

Parent-attachment and Peer-attachment

To reduce the length of the survey, the scale used to measure parent-attachment construct was adapted from Vignoli and Mallet's (2004), which is a shortened version of Armsden and Greenberg's (1987) scale, consisting of 14 items. Peer-attachment was measured using Armsden and Greenberg's (1987) scale of 17 questions.

Parental mediation

The parental mediation scale was developed from a list of 10 questions ranging from “my parents know who I am chatting with”, “know the amount of time I spend online”, to “I tell my parents about the things I see online”.

Risky online activities

Risky online activities were measured by four formative indicators including intention online gambling, chatting with strangers, playing online violent games and surfing pornographic websites.

4.2 Participants

The participants were 2,000 school students of 16 randomly selected urban schools from four randomly chosen states of Peninsular Malaysia (Penang, Kuala Lumpur, Melaka and Kelantan). The methods and survey complied with Multimedia University’s ethical standards and permission was sought from the Malaysian Federal Education and the respective States Education Ministries. Participation was anonymous and voluntary. The response rate was above 96% with students completing the questionnaire booklet in a single formal teaching session during school hours. Incomplete and inconsistent responses were filtered out leaving 1,449 respondents. The profile of respondents is shown in Table 1. There were 884 Malays (61%), 436 Chinese (30.1%) and 107 Indians (7.4%) in the sample data collected. The ethnicity profile of the entire population census in Peninsular Malaysia being as follows: Malays 59.7%; Chinese 23.6%, Indians 8.4%. (Department of Statistics, 2014). As Malaysian Chinese typically resides in urban areas, there is naturally higher Chinese representation in the survey. For example, Chinese make up of 27% and 43% of the population in Selangor and Penang respectively, the two most industrialized states in Malaysia. Hence, the ethnic composition of the sample data though not representative of the entire population of Malaysia, is representative of the urban population of Malaysia.

Table 1

Profile of Survey Respondents

Demographic	No.	Frequency
Gender		
Male	675	46.6
Female	774	53.4
Age		
15	447	30.8
16	440	30.4
17	562	38.8
Ethnicity		
Malay	884	61.0
Chinese	436	30.1

Indian	107	7.4
Others	22	1.5

5.0 Data Analysis

Partial Least Square based Structural Equation Modelling (PLS-SEM) analysis was undertaken because it allows the structural and the measurement models to be tested simultaneously. The advantages of PLS-SEM include the capability to handle reflective and formative measures as well as fewer demands on data distribution and sample size (Hair et al., 2017). The research model was first evaluated on its measurement model, followed by structural model by using Smart-PLS version 3.2.1 (Anderson and Gerbing, 1988; Ringle et al., 2015). Factor analysis using Harman's single factor test showed that the first factor accounted for 14.656% of variance, which is lower than suggested threshold level of 50% of total variance explained (Podsakoff et al., 2003), indicating common method bias is not evident. This meant that common method bias was not a substantive threat to the validity of the research model in the survey questionnaire.

5.1 Assessment of the Measurement Model

As the research model involved both reflective and formative measures, we first assessed the reflective measures by performing confirmatory factor analysis (CFA) to examine the reliability, convergent validity and discriminant validity (Hair et al., 2017). As seen in Table 2, the values of Cronbach's Alpha, ranged from 0.861 to 0.895, and Composite Reliability (CR), ranged from 0.891 to 0.913, which were greater than the desired value of 0.7, indicating that an adequate internal consistency of constructs was achieved. To establish the convergent validity of the measurement, an examination of measures on factor loadings and AVE is required. Loadings for all the reflective items were retained when the value was greater than 0.7 and removed when the value was lower than 0.4 (Hair et al., 2017). Reflective items with loadings between 0.4 and 0.7 were retained in the construct as far as the average variance extracted (AVE) of the constructs was greater than 0.5, supporting convergent validity (Fornell and Larcker, 1981).

The validation of discriminant validity of reflective measures followed the Fornell-Larcker criterion (Hair et al., 2017). As presented in Table 3, the construct's square root of the average variance extracted is higher than the off-diagonal elements in their corresponding row and column. Though the Fornell-Larcker criterion is commonly used to assess discriminant validity, it has recently been criticized for being lack of sensitivity in detecting discriminant validity issue. Hence, an alternative approach, heterotrait-monotrait (HTMT) criterion, was used to test the discriminant validity (Henseler et al., 2015). As shown in Table 4 the HTMT criterion was lower than the suggested value of 0.90 for all the constructs

with the confidence interval of lower than 1 (Gold et al., 2001; Hair et al., 2017), indicating discriminant validity.

Risky online activities are the only formatively measured construct, necessitating a different assessment of measurement model from that of a reflective measured construct. We first assessed the multicollinearity between indicators by determining the variance inflation factor (VIF). The VIF values for four formative indicators ranged from 1.148 to 1.235, which are lower than the suggested value of 5 (Diamantopoulos and Siguaw, 2006; Hair et al., 2017). After ensuring the formative indicators are not highly correlated, we assess the significance of the weights. Four formative indicators of online risk activities (Intentional-Pornography, Online Chatting with Strangers, Violent-Contents and Online-Gambling) were found to be significant.

Table 2
Measurement Model

Construct	Item	Item Loading / Weight	Cronbach's Alpha	CR	AVE
Internet Addiction (Reflective)	Add3	0.648	0.870	0.898	0.525
	Add4	0.762			
	Add5	0.706			
	Add6	0.662			
	Add8	0.738			
	Add9	0.754			
	Add10	0.809			
	Add11	0.705			
Parental Mediation (Reflective)	Mon1	0.697	0.861	0.891	0.505
	Mon2	0.685			
	Mon3	0.792			
	Mon4	0.662			
	Mon5	0.624			
	Mon7	0.724			
	Mon9	0.726			
	Mon10	0.763			
Parent-	Parent1	0.706	0.895	0.913	0.515

	Parent2	0.720			
	Parent4	0.754			
	Parent5	0.698			
	Parent6	0.797			
	Parent7	0.739			
	Parent8	0.754			
	Parent10	0.613			
	Parent12	0.680			
	Parent14	0.697			
Peer-attachment (Reflective)	Peer1	0.765	0.886	0.909	0.589
	Peer2	0.781			
	Peer7	0.805			
	Peer9	0.712			
	Peer14	0.739			
	Peer16	0.741			
	Peer17	0.825			
Risky online Activities (Formative)	IntGambling	-0.124	-	-	-
	IntSex	0.702			
	IntUnknownPe ople	-0.094			
	IntViolen	0.580			

Table 3

Discriminant Validity (Fornell-Larcker criterion)

Construct	Mean	STD	Age	Gender	Internet Addiction	Risky Online Activities	Parental Mediation	Parent-Attachment	Peer-Attachment
1 Age	16.079	0.831	1.000						
2 Gender	0.534	0.499	-0.011	1.000					
3 Internet Addiction	2.368	0.874	0.006	-0.193	0.725				
4 Risky Online Activities	1.845	1.107	0.078	-0.572	0.310	-			
5 Parental Mediation	2.696	0.869	-0.088	0.219	-0.079	-0.247	0.711		
6 Parent-Attachment	3.340	0.838	-0.001	0.032	-0.213	-0.085	0.388	0.717	
7 Peer-Attachment	3.301	0.874	0.037	0.238	0.020	-0.086	0.120	0.225	0.768

Table 4:

Discriminant Validity (HTMT criterion)

Construct	Age	Gender	Internet Addiction	Parental Mediation	Parent Attachment	Peer Attachment
1. Age						
2. Gender	0.011 CI _{.90} [0.000, 0.030]					
3. Internet Addiction	0.029 CI _{.90} [0.012, 0.033]	0.202 CI _{.90} [0.156, 0.246]				
4. Parental Mediation	0.092 CI _{.90} [0.049, 0.139]	0.228 CI _{.90} [0.183, 0.274]	0.108 CI _{.90} [0.078, 0.118]			
5. Parent Attachment	0.024 CI _{.90} [0.014, 0.021]	0.046 CI _{.90} [0.027, 0.060]	0.238 CI _{.90} [0.191, 0.289]	0.426 CI _{.90} [0.379, 0.468]		
6. Peer Attachment	0.042 CI _{.90} [0.021, 0.076]	0.244 CI _{.90} [0.200, 0.287]	0.056 CI _{.90} [0.042, 0.059]	0.140 CI _{.90} [0.094, 0.189]	0.255 CI _{.90} [0.202, 0.307]	

5.2 Structural Model Evaluation

In the second stage, the structural model was assessed in terms of the collinearity among the set of constructs, coefficient of determination (R^2 value), significance of path coefficients and effect size (f^2) and the results presented in Table 5. The model was a good fit as the Standardized Root Mean Square Residual (SRMR) was 0.055, below the recommended value of 0.08 (Henseler et al., 2016). The VIF value for the set of independent variables on each dependent (Internet Addiction and Risky Online Activities) was well below the common cut-off threshold for multicollinearity: the VIF value for each predictor of Internet addiction and risky online activities ranged from 1.011 to 1.251 (same predictors), well below the threshold of 5 (Diamantopoulos and Siguaaw, 2006; Hair et al., 2017). The significance of path coefficients was examined by performing the nonparametric bootstrapping procedure of 5,000 resamples (Hair et al., 2017).

Child-Parent attachment was found to have a significant negative relationship with Internet addiction ($\beta = -0.255$, $t = 8.487$, $p < 0.01$) but no significant relationship with risky online activities ($\beta = -0.039$, $t = 1.539$, $p > 0.05$). Thus, H1a was supported while H1b was not. Next, peer-attachment was found to have a positive significant relationship with addiction ($\beta = 0.125$, $t = 1.969$, $p < 0.05$) and risky online activities ($\beta = 0.068$, $t = 1.753$, $p < 0.05$), supporting H2a and H2b. The analysis also showed support for H3 as the relationship between parent-attachment and parental mediation was found to be significant ($\beta = 0.388$, $t = 16.768$, $p < 0.01$). The study found support for H4a: parental mediation had a significant effect on Internet addiction ($\beta = 0.055$, $t = 1.675$, $p < 0.05$). Parental mediation was also found to have a significant negative effect on risky online activities ($\beta = -0.112$, $t = 3.748$, $p < 0.01$), supporting H4b.

With regard to control variables, age was found to be significantly and statistically related to risky online activities ($\beta = 0.060$, $t = 2.544$, $p < 0.01$) but not to Internet addiction ($\beta = 0.003$, $t = 0.134$, $p > 0.05$). Gender was found to be significantly related to internet addiction ($\beta = -0.227$, $t = 8.687$, $p < 0.01$) and risky online activities ($\beta = -0.562$, $t = 28.508$, $p < 0.01$). The model was found to account for 34.9% and 9.3% of the variance of online risky activities and internet addiction respectively. The results are summarized in Figure 2. The effect size (f^2) for each relationship is presented in Table 5. The interpretation of effect size follows the guideline recommended by Cohen (1988) in which 0.02, 0.15 and 0.35 indicate small, medium and large effect size respectively. To assess the predictive capability of the model, we performed the blindfolding procedure to obtain the value of cross-validated redundancy (Q^2) (Chin, 1998). A value of higher than zero for Q^2 suggests that the model has reasonable predictive capability (Fornell and Cha, 1994). However, the assessment of predictive relevance is only applicable for reflectively measured endogenous variables; therefore, only the Q^2 value for internet addiction was

reported, which is 0.047, suggesting there was predictive relevance for the model in predicting internet addiction.

Table 5
Structural Model

Hypothesis	Relationship	Path Coeff	95% CI	Std Error	t-stats	P-value	Decision	f ²
H1a	Parent-attachment -> Internet Addiction	-0.255	[-0.302, -0.203]	0.030	8.487	0.000	Supported	0.058
H1b	Parent-attachment -> Risky Online Activities	-0.039	[-0.084, 0.001]	0.025	1.539	0.062	Not Supported	0.002
H2a	Peer-attachment -> Internet Addiction	0.125	[-0.091, 0.177]	0.064	1.969	0.025	Supported	0.015
H2b	Peer-attachment -> Risky Online Activities	0.068	[0.028, 0.119]	0.039	1.753	0.040	Supported	0.006
H3	Parent-attachment -> Parental Mediation	0.388	[0.345, 0.422]	0.023	16.768	0.000	Supported	0.177
H4a	Parental Mediation -> Internet Addiction	0.055	[-0.001, 0.106]	0.033	1.675	0.047	Supported	0.003
H4b	Parental Mediation -> Risky Online Activities	-0.112	[-0.159, -0.061]	0.030	3.748	0.000	Supported	0.015
	Age -> Internet Addiction	0.003	[-0.037, 0.045]	0.025	0.134	0.447		
	Gender -> Internet Addiction	-0.227	[-0.269, -0.184]	0.026	8.687	0.000		
	Age -> Risky Online Activities	0.060	[0.022, 0.098]	0.023	2.544	0.004		
	Gender -> Risky online Activities	-0.562	[-0.594, -0.530]	0.020	28.508	0.000		

* p < 0.05. ** p < 0.01

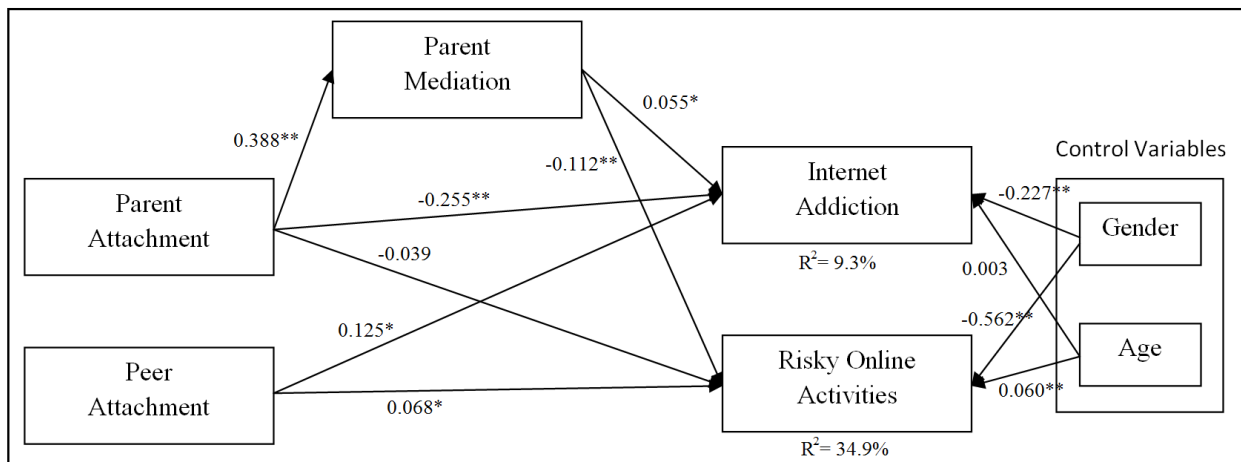


Fig. 2 Results of Model Testing

6.0 Discussion

The primary goal of this study was to examine in the context of youth's online risky activities, whether the compensatory-competition model or the continuity-cognitive model prevails. The results support the compensatory-competition model. In other words, peers do not complement but compete with parents in influencing youths' online risky behavior and Internet addiction. This finding corroborates extant research that peer-attachment is positively correlated to Internet addiction and risky online activities (Lam and Chan, 2007). Conversely, the finding is also consistent with extant research that child-parent attachment counters Internet addiction and online risky activities (Deng et al, 2013; Chen et al., 2015).

One puzzling finding of this study is that child-parent attachment was not significantly related with risky online behavior. Possible reasons are that adolescents' need for sensation-seeking supersedes their attachment to parents (Mounts, 2004) and that child-parent attachment becomes insignificant because peers play a much more dominant role in regards to online risky activities. as revealed by brain imaging studies (Dustin et al., 2013).

This study suggests that close parent-child attachment by itself is insufficient to deter children risky online activities. Hence, parents need to actively engage in activities such as monitoring and mediating in order to reduce their children's risky online activities and addiction. Parental engagement of mediation activities in this study was found to significantly reduce risky online activities and addiction.

Furthermore, because child-peer attachment significantly correlated with risky online activities, parents should guide the choice of their children's friends, monitor and, if possible, influence the peers of their children. In addition, the parents of the children's friends could also guide the child, as recent empirical research suggests that parents can work through their children's peers and the parents of the peers (e.g. Cleveland et al., 2012; Ragan et al., 2014). Future research could investigate the influence of online friends and how they influence could be different from offline friends (Huang et al., 2013).

Overall, it is probably reassuring to parents that the effect size of the influence of parents is higher ($f^2 = 0.058$ for Internet addiction and $f^2 = 0.002$ online risky activities) than that of the influence of peers ($f^2 = 0.015$ for Internet addiction, $f^2 = 0.006$ for online risky activities). Moreover, if parents actively mediate their children's online activities, they further reduce their children's online risky behavior ($f^2 = 0.015$) and Internet addiction ($f^2 = 0.003$). These findings should be a great relief for parents to know that they can be more influential than their children's friends on online risky activities and addiction. Parents need to play a more active role such as getting to know about their children's online activities, the type of games, the duration online and when they go online. Parents should keep themselves updated on the Internet as well as talk with their children about the children's online activities, both the

fun and dangers involved. Parents should also consider regulating Internet usage of their children, such as regulating the amount of time the child can go online or installing software filters.

Finally, parents need to be educated that even if they may be limited in their knowledge of the Internet, they can play a vital role in influencing their children online activities. As Steinberg (2001) had pointed out as far back as 2001, it would be good to institute a systematic large-scale on-going public program to educate parents that they have a significant role to play in raising up their children and how to play this role effectively.

The findings of this study should be considered in the light of several limitations. First, this study was designed as a cross-sectional, not longitudinal, one and therefore, does not allow inference of causal relationships. Second, online risky activities were assessed using only four measures: chatting with strangers, playing violent games, cyber-pornography, and online gambling. Although these measures provide a reliable measure of the concept of risky online activities, studies that broaden the measures could provide more information.

7.0 Conclusion

This research found that peers and parents “compete” with each other to influence youths in the area of risky online activities and Internet addiction. The influence of peers increases teenagers’ Internet addiction, while the influence of parents reduces it. Parents would also need to actively mediate their children’s online activities. Overall, provided parents participate in some form of mediation of their children online activities, parents have more influence than peers on children Internet addiction and risky online activities. That parental influence can outweigh peer influence should provide some relief to parents who are anxious about the effects of the Internet usage of their children: they can influence their teenagers and parental mediation can be successful.

Nevertheless, because the influence of peers can be significant, a major implication of this study is that educating parents alone is not enough. Influential youths should also be targeted as part of the larger community effort to educate youths about the possible risks in online activities.

Footnotes

A version of this paper was presented at the 67th Annual Conference of the International Communications Association in May 2017 at San Diego, United States of America

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References

- Ainsworth, M. D. S., 1973. The development of infant-mother attachment, In: Cardwell, B. & Ricciuti, H. (eds.). *Review of Child Development Research*. University of Chicago Press. Chicago, CHI, 1–94.
- Anderson, J.C., Gerbing, D.W., 1988. Structural equation modelling in practice: A review and recommended two stage approach. *Psychol. Bull.* 103(3), 411-423.
- Allen, J. P., McElhaney, K. B., Land, D. J., Kuperminc, G. P., Moore, C.W., O'Beirne-Kelly, H., & Kilmer, S. L. 2003. A secure base in adolescence: Markers of attachment security in the mother-adolescent relationship. *Child. Dev.* 74(1), 292–307.
- Armsden, G. C., & Greenberg, M.T., 1987. The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *J. Youth. Adolesc.* 16 (5), 427–454.
- Aseltine, R. H., 1995. A reconsideration of parental and peer influences on adolescent deviance. *J. Health. Soc. Behav.* 36 (2), 103–121.
- Beniot, D., 2004. Infant-parent attachment: Definition, types, antecedents, measurement and outcome. *Paediatr. Child. Health.* 9(8), 541–545.
- Berkowitz, A.D., 2005. An overview of the social norms approach. In: Lederman, L. C., & Stewart, L. P. (eds.). *Changing the culture of college drinking: A socially situated health communication campaign*. Hampton Press. Cresskill, NJ.
- Bowlby, John., 1982. *Attachment and loss. Vol 1: Attachment.* (2nd edition). Basic Books. New York, NY.
- Cai, M. F., Hardy, S. A., Olsen, J. A., Nelson, D.A., & Yamawaki, N., 2013. Adolescent–parent attachment as a mediator of relations between parenting and adolescent social behavior and wellbeing in China. *Int. J. Psychol.* 48(6), 1185-1190.
- Center for Cyber Safety and Education, 2016. *Children's Internet usage study*. <<https://safeandsecureonline.org/childrens-internet-study/>>
- Chang, F. C., Chiu, C. H., Miao, N. F., Chen, P. H., Lee, C. M., Chiang, J. T., & Pan, Y. C., 2015. The relationship between parental mediation and Internet addiction among adolescents, and the association with cyberbullying and depression. *Compr. Psychiatry.* 57, 21-28.

- Chen, W., Li, D., Bao, Z., Yan, Y., & Zhou, Z. (2015). The Impact of Parent-Child Attachment on Adolescent Problematic Internet Use: A Moderated Mediation Model. *Xinli Xuebao, Acta. Psychol. Sinica.* 47(5), 623-635.
- Charlton, J. P., & Danforth, I. D. W., 2010. Validating the distinction between computer addiction and engagement: Online game playing and personality. *Behav. Inf. Technol.* 29(6), 601–613.
- Charlton, J. P., & Danforth, I. D. W., 2007. Distinguishing addiction and high engagement in the context of online game playing. *Comput. Human. Behav.* 23 (3), 1531– 1548.
- Chen, S. X., Bond, M. H. & Tang, D., 2007. Decomposing filial piety into filial attitudes and filial enactments. *Asian J. Soc. Psychol.* 10(4), 213 – 223.
- Cheung, Y. W., 1997. Family, school, peer, and media predictors of adolescent deviant behavior in Hong Kong. *J. Youth. Adolesc.* 26 (5), 569-596.
- Chin, W. W., 1998. The partial least squares approach to structural equation modelling, In: Marcoulides, G. (Ed.), *Modern methods for business research.* Mahwah, Lawrence Erlbaum, 295-358.
- Claes, M., Lacourse, E., Ercolani, A. P., Pierro, A., Leone, L., & Presaghi, F., 2005. Parenting, peer orientation, drug use, and anti-social behavior in late adolescence: A cross-national study. *J Youth Adolesc.* 34(5), 401 - 411
- Cleveland M.J., Feinberg M.E., Osgood D.W., Moody J., 2012. Do peer' parents matter? A new link between positive parenting and adolescent substance use. *J. Stud. Alcohol. Drugs.* 73(3), 423-433.
- Cohen, J., 1988. *Statistical power analysis for the behavioral sciences.* (2nd edition). Hillsdale, Erlbaum Associates.
- Cooper, C. R., & Ayers-Lopez, S., 1985. Family and peer systems in early adolescence: New models of the role of relationships in development. *J. Early. Adolesc.* 5(1), 9-21.
- Cooper, M. L., Shaver, P. R., & Collins, N. L., 1998. Attachment styles, emotion regulation, and adjustment in adolescence. *J. Pers. Soc. Psychol.* 74(5), 1380-1397.
- Crosnoe, R., Cavanagh, S., & Elder, G. H. 2003. Adolescent friendships as academic resources: The intersection of friendship, race and school disadvantage. *Sociol. Perspect.* 46(3), 331–352.
- Dalessandro, A. M., & Chory-Assad, R.M., 2006. Comparative significance of parental vs. peer mediation of adolescents' antisocial video game play. paper presented at the annual meeting of the International Communication Association, Dresden Germany.
- Davies, J., 2007. Peer influences on sexual media use, paper presented at the annual meeting of the International Communication Association conference (San Francisco).
- Debarun, M., 2003. Understanding the dimensions of parental and peer influence on risky sexual behavior among adolescents. Paper presented at the annual meeting of the American Sociological Association, Atlanta.
- Deng, L. Y., Fang, X. Y., Wu, M. M., Zhang, J. T., & Liu, Q. X., 2013. Family environment, parent-child attachment and adolescent Internet addiction. *Psychol. Dev. Educ.* 3, 305-311.
- Department of Statistics, Malaysia, 2014. <<https://www.statistics.gov.my>>
- Diamantopoulos, A., & Sigauw, J. A., 2006. Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *Br. J. Manag.* 17(4), 263-282.

- Dustin, A., Chein, J., & Steinberg, L., 2013. The teenage brain: Peer influence on adolescent decision-making. *Curr. Dir. Psychol. Sci.* 22(2), 114-120.
- Fornell, C., & Cha, J., 1994. Partial least squares, In: Bagozzi, R. P., (ed.), *Advanced methods of marketing research*. Blackwell., Cambridge, England, 52-78.
- Fornell, C., & Larcker, D. F., 1981. Evaluating structural equation models with unobservable and measurement error. *J. Mark. Res.* 18(1), 39-50.
- Gold, A.H., Malhotra, A., & Segars, A.H., 2001. Knowledge management: an organizational capabilities perspective. *J. Manage. Inform. Syst.* 18(1), 185-214.
- Guo, W. X., & Nathanson, A. I., 2011. The effects of parental mediation of sexual content on the sexual knowledge, attitudes, and behaviors of adolescents in the US. *J. Child. Media.* 5 (4), 358-378.
- Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., 2017. *A primer on partial least squares structural equation modeling (PLS-SEM)*, (2nd edition). Sage, Thousand Oaks.
- Harris, J. R. (1998). *The nurture assumption: Why children turn out the way they do*. New York: Free Press.
- Henseler, J., Ray, P.A., & Hubona, G., 2016. Using PLS path modeling in new technology research: updated guidelines. *Ind. Manage. Data. Syst.* 116(1), 2-20.
- Henseler, J., Ringle, C.M., & Sarstedt, M., 2015. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Market. Sci.* 43(1), 115-135.
- Huang, G.C., Unger, J.B., Soto D., Fujimoto, K., Pentz, M.A., Jordan-Marsch, M., Valent,e T.W. 2013. Peer Influences: The impact of online and offline friendship networks on adolescent smoking and alcohol use. *J. Adolesc. Health.* 54(5), 508-514.
- Ismail, N., Jo-Pei, T., & Ibrahim, R., 2009. The relationship between parental belief on filial piety and child psychosocial adjustment among Malay families. *Pertanika J. Soc. Sci. Hum.*, 17(2), 215–224.
- Jiow, H. J., Lim, S. S., & Lin, J. (2016). Level up! Refreshing parental mediation theory for our digital media landscape. *Commun. Theory.* 27(3), 309–328.
- Kerr, M., & Stattin, H., 2000. What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring. *Dev. Psychol.* 36(3), 366-380.
- Kirwil, L., 2009. Parental mediation of children's Internet use in different European countries. *J. Child. Media.* 3(40), 394-409.
- Lam, C.B., & Chan, D. K. S., 2007. The use of cyberpornography by young men in Hong Kong: Some psychosocial correlates. *Arch. Sex. Behav.* 36 (4), 588–598.
- Lamborn, S. D., & Steinberg, L., 1993. Emotional autonomy redux: Revisiting Ryan and Lynch. *Child. Dev.* 64(2), 483–99.
- Law, D. M., Shapka, J. & Olson. B. F., 2010. To control or not to control. Parental behaviours and adolescent online aggression. *Comput. Human. Behav.* 26(6), 1651-1656,
- Lee, S. J., 2013. Parental restrictive mediation of children's internet use: Effective for what and for whom?. *New Media & Soc*, 15(4), 466-481.
- Lee, S.J., & Chae, Y.G., 2007. Children's internet use in a family context: influence on family relationships and parental mediation. *Cyberpsychol. Behav.* 10(5), 640-644.

- Lei, L., & Wu, Y., 2007. Adolescents' parental attachment and their Internet use. *Cyberpsychol. Behav.* 10(5), 633-639.
- Lemish, D., Ribak, R., & Aloni, R., 2009. Israel children go online: From moral panic to responsible parenthood. *Megamot.* 46(1-2), 137-163.
- Livingstone, S., & Helsper, E., 2008. Parental mediation of children's Internet use. *J. Broadcast. Electron. Media.* 52(4), 581-599.
- Malaysian Communications and Multimedia Commission, 2016. Internet Users Survey 2016. <<https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/IUS2016.pdf>>
- Moretti, M. M., & Peled, M., 2004. Adolescent-parent attachment: Bonds that support healthy development. *Paediatr. Child. Health.* 9(8). 551-555
- Moretti MM, Holland R., 2003. Navigating the journey of adolescence: Parental attachment and the self from a systemic perspective. In: Johnson, S., & Whiffen, V., (eds.). *Clinical Applications of Attachment Theory.* Guildford, New York, NY, 41–56.
- Mounts, N. S., 2004. Adolescents' perceptions of parental management of peer relationships in an ethnically diverse sample. *J. Adolesc. Res.* 19(4), 446-467.
- Nathanson, A. I., 2001. Parents versus peers: Exploring the significance of peer mediation of antisocial television. *Commun. Res.* 28(3), 251-274.
- Nathanson, A. I., 2008. Parental mediation strategies, In: Donsbach, W. (ed.), *The International Encyclopedia of Communication.* Vol 10, Wiley-Blackwell Publishing., Malden, 4732-4735.
- Nickerson, A. B., & Nagle, R. J., 2005. Parent and peer attachment in late childhood and early adolescence. *J. Early. Adolesc.* 25(2), 223-249.
- Patterson, G.R., Dishion, T.J., & Yoerger, K., 2000. Adolescent growth in new forms of problem behavior: Macro-and micro-peer dynamics. *Prev. Sci.* 1(3), 3-13.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P., 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88(5), 879–903.
- Ragan, D.T., Osgood, D.W., & Feinberg, M. E., 2014. Friends as a bridge to parental influence: Implications for adolescent alcohol use. *Soc. Forces.* 92(3), 1061-1085.
- Ringle, C.M., Wende, S., Becker, J.M., 2015. *Smart PLS 3*, Bonningstedt: SmartPLS. <<http://www.smartpls.com>>
- Ryan, R. M., & Lynch, J. H., 1989. Emotional autonomy versus detachment: Revisiting the vicissitudes of adolescence and young adulthood. *Child. Dev.* 60(2), 340–56.
- Sasson, H., & Mesch, G., 2014. Parental Mediation, Peer Norms and Risky Online Behaviors among Adolescents. *Comput. Human. Behav.* 33, 32-38.
- Soh, P.C.H., Charlton, J., & Chew, K.W., 2014. The Influence of Parental and Peer Attachment on Internet Usage motives and addiction. *First Monday.* 19(7).
- Stattin, H. & Kerr, M., 2000, Parental monitoring: A reinterpretation. *Child. Dev.* 71(4), 1072–1085.
- Steinberg, L., 2001. We know some things: Parent-Adolescent relationships in retrospect and prospect. *J. Res. Adolesc.* 11(1), 1-19.

- The Star, 2017. RAGE against the predators. < <http://www.thestar.com.my/news/nation/2017/03/29/rage-against-the-predators/> >
- Vignoli, E., & Mallet, P., 2004. Validation of a brief measure of adolescents' parent attachment based on Armsden and Greenberg's three-dimension model. *Eur. Rev. Appl. Psychol.* 54(4), 251-260.
- Wilkinson, R. B., 2004. The role of parental and peer attachment in the psychological health and self-esteem of adolescents. *J. Youth. Adolesc.* 33(6), 479-492.
- Wilkinson, R.B., & Kraljevic, M., 2004. Adolescent psychological health and school attitudes: The impact of attachment relationships. Proceedings of the Australian Psychological Society's Psychology of Relationships Interest Group 4th Annual Conference. Melbourne. Australia. 150-155.
- Widyanto L. & Griffiths M. 2006, Internet addiction; does it really exist? (revisited). In J. Gackenbach (Ed.), *Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications*, 2nd Edn. New York: Academic Press.
- Yang, X.J., Zhu, L., Chen, Q., Song, P.P., & Wang, Z.H., 2016. Parental marital conflict and Internet addiction among Chinese college students: The mediating role of father-child, mother-child, and peer attachment. *Comput. Human. Behav.* 59, 221-229.
- Young, J.W., & Ferguson, L.R., 1979. Developmental changes through adolescence in the spontaneous nomination of reference groups as a function of decision content. *J. Youth. Adolesc.* 8(2), 239-252.
- Young, K.S., 2004. Internet addiction: A new clinical phenomenon and its consequences. *Am. Behav. Sci.* 48(4), 402-415.

Appendix 1: Details of Adapted Scales Used.

Internet Addiction Scale		
Original Item	Adapted Item	Reason for Change
I sometimes neglect important things because of an interest in Asheron's Call	I sometimes don't do important things because of an interest on the Internet	Malaysian school students may not understand the word "neglect".
My social life has sometimes suffered because of me playing Asheron's Call	My social life has never suffered because of my Internet activities	Recoded to be a negative question to strengthen the scale
Playing Asheron's Call has sometimes interfered with my work	Internet activities have sometimes interfered with my studies	
When I am not playing Asheron's Call I often feel agitated	When I am not on the Internet, I often feel disturbed	Malaysian students may not understand the word "agitated"
I have made unsuccessful attempts to reduce the time I spend playing Asheron's Call	I have made unsuccessful attempts to reduce the time I spend on the Internet	
I am sometimes late for engagements because I am playing Asheron's Call	I am sometimes late for school because of my activities on the Internet	Malaysia students may not understand the word "engagements". The synonym "meeting" is changed to "school".
Arguments have sometimes arisen at home because of the time I spend on Asheron's Call	Arguments have sometimes arisen at home because of the time I spend on the Internet	
I think I am addicted to Asheron's Call	I think that I am addicted to the Internet	
I often fail to get enough sleep because of playing Asheron's Call	I often fail to get enough sleep because of my Internet activities	
I never miss meals because of my Internet activities	I sometimes skip meals because of my Internet activities	Difficult for Malaysian school students to comprehend a double negative statement
I have never used Asheron's Call as an escape from socializing	I sometimes used the Internet to escape from spending time with family and friends	Difficult for Malaysian school students to comprehend a double negative statement
I often feel a sense of power when I am playing Asheron's Call		Item dropped because the researcher felt it was not appropriate for Internet usage

I often feel that I spend more money than I can afford on Asheron's Call		Item dropped because the researcher felt it was not appropriate for Internet usage
Parent Attachment Scale		
My parents respect my feelings		
My parents sense when I'm upset about something	My parents sense when I am upset about something	Higher chances of comprehension by Malaysian school children
I get upset a lot more than my parents know about		
When we discuss things, my parents consider my point of view		
My parents trust my judgement		
My parents help me to understand myself better		
I tell my parents about my problems and troubles		
My parents encourage me to talk about my difficulties		
I don't know whom I can depend on these days		
I trust my parents		
My parents don't understand what I'm going through these days	My parents don't understand what I am going through these days	Higher chances of comprehension by Malaysian school children
I can count on my parents when I need to get something off my chest.	I can count on my parents when I need to talk about something bothering me.	Higher chances of comprehension by Malaysian school children
I feel that no-one understands me	I feel that my parents do not understand me	Higher chances of comprehension by Malaysian school children
If my parents know something is bothering me, they ask me about it		
Peer Attachment Scale		
My friends sense when I am upset about something		
My friends understand me		
My friends encourage me to talk about my difficulties		
I feel the need to be in touch with my friends more often		

My friends don't understand what I am going through these days		
I feel alone or apart when I am with my friends		
My friends listen to what I have to say		
My friends are fairly easy to talk to		
When I am angry about something, my friends try to be understanding		
My friends are concerned with my well-being		
I feel angry with my friends		
I can count on my friends when I need to get something off my chest	I can count on my friends when I need to talk about something bothering me	Higher chances of comprehension by Malaysian school children
I trust my friends		
My friends respect my feelings		
I get upset a lot more than my friends know about		
I tell my friends about my problems and troubles		
If my friends know something is bothering me, they ask me about it		
Risky Online Activities		
How often have you participated in the following Internet activities		
Violent online games		
Pornographic Websites		
Online chatting with unknown people		
Online betting/ gambling		
Parental Mediation		
My parents know who I am chatting with or emailing to		
My parents know about the amount of hours I spend on the Internet		
My parents know about the things I see online		
My parents know what time I use the Internet e.g. night time		
My parents watch the PC screen when I am using the Internet		
My parents stay nearby when I am using the Internet		

I tell my parents about the things I see on the Internet		
I need to ask my parents for permission each time I use the Internet		
I tell my parents about the things that happened to me online e.g. stranger trying to friend me or pop up sex message		
My parents know about what things I talk about online or email		