

# Adolescents' privacy concerns and information disclosure online: The role of parents and the Internet

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**ADOLESCENTS' PRIVACY CONCERNS AND INFORMATION DISCLOSURE  
ONLINE: THE ROLE OF PARENTS AND THE INTERNET**

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**ONLINE: THE ROLE OF PARENTS AND THE INTERNET**

**Abstracts**

This study investigated the role of parents and the Internet in adolescents' online privacy concerns and information disclosing behaviors. Specifically, instructive and restrictive parental mediation, adolescents' self-disclosure to parents about their Internet experiences, time spent on the Internet, and participation in online communication activities were examined as factors that may impact adolescents' concerns about online privacy, willingness to disclose personally identifiable information, and actual disclosure of personal information online. A survey conducted in Singapore with 746 adolescents aged 12-18 revealed that instructive parental mediation based on parent-adolescent communication was more effective than restrictive parental mediation based on rule-making and controlling in reducing information disclosure among adolescents. Adolescents' self-disclosure to parents about their Internet experiences was found to be positively associated with their privacy concerns but did not foster privacy protection behaviors. While online chatting had a positive relationship with privacy concerns, excessive use of the Internet and frequent participation in social networking and online gaming resulted in increased information disclosure.

Keywords: Adolescents, Internet use, online privacy, parental mediation, online communication

## 1. Introduction

Online communication has become an indispensable part of adolescents' lives (Turkle, 2011). According to Pew Research Internet Project (2013a), 93% of teens aged 12-17 in the USA have a computer at home, and about 74% of them surf the Internet on mobile devices. EU Kids Online (Livingstone, Haddon, Gorzig, & Olafsson, 2011) reported that 77% of teens aged 13-16 in Europe have a profile on a social networking site (SNS), and that one third of them have more than 100 contacts on their SNSs.

Adolescents' prevalent use of the Internet for communication and social interactions has raised concerns about their vulnerability to privacy risks (Feng & Xie, 2014). A survey with teens aged 13-17 in the USA revealed that adolescents share various types of personal information such as their name, email address, and photos of themselves online (McAfee, 2010). EU Kids Online has found that only 43% of social networking site users aged 9-16 set their social network profiles as private (Livingstone et al., 2011). Pew Research Internet Project (2013b) has reported that the number of adolescents sharing personal information online is on an upward trend. That is, more adolescents share personal information online today than they did in the past.

Parents are worried about risks associated with information sharing and try to monitor and control their children's Internet use (McAfee, 2012; Livingstone et al., 2011). However, it is not an easy task for parents to effectively supervise their adolescent children's Internet use and assess risks associated with it. One reason might be that adolescents develop ways to avoid parental monitoring as they become experienced in media technology. According to McAfee (2012), about 7 in 10 adolescents have hidden their online behaviors from their parents by using strategies such as clearing the browser history, minimizing the web browser when parents are nearby, and deleting instant messages. Furthermore, as adolescents tend to pursue more autonomy and freedom from their parents and consider Internet use as a personal

activity, they are not very willing to share their online experiences with parents and feel even resentful if parents attempt to control their Internet activities (Valkenburg, Piotrowski, Hermanns, & de Leeuw, 2013).

Despite the challenges parents face, research *does* suggest that parents affect how adolescents use and are influenced by the Internet (Mesch, 2009; Livingstone & Helsper, 2008; Livingstone et al., 2011). Thus, an important question would be “*Which type of parental practice increases or decreases adolescents’ privacy risks online?*” Guided by parental mediation theory (Clark, 2011) and parental knowledge theory (Kerr & Stattin, 2000), the present study attempts to answer this question by examining how parental efforts to mediate adolescents’ Internet use (parental mediation) and adolescents’ talking to their parents about their Internet experiences (self-disclosure to parents) are associated with adolescents’ online privacy-related perceptions and behaviors (privacy concerns, willingness to disclose personally identifiable information (PII), and actual disclosure of personal information online).

In addition to parental influence, this study examines the role of the Internet. Media play an important role in youths’ acquisition and development of social skills and behaviors (John, 1999), and today’s adolescents rely heavily on the Internet to develop self-identity and social relationships (Turkle, 2011). Prior studies have suggested that higher levels of Internet use can increase the chance that adolescents engage in risky online behaviors (Livingstone & Helsper, 2008; McAfee, 2012). However, little is known about *which type of Internet activity increases privacy risks among adolescents*. Thus, this study investigates how the levels of engagement in different types of online communication activities, as well as the amount of time spent on the Internet, are associated with privacy perceptions and behaviors of adolescents.

## **2. Literature Review**

### ***2.1 Concept of Privacy and Online Privacy Issues among Adolescents***

While privacy has been conceptualized in many ways across different disciplines (Wildemuth, 2008), the current study adopted the concept of privacy proposed by Westin (1967), who defined privacy as individuals' right to manage and control their personal information in the process of communication. Westin's concept of privacy suggests that one's privacy management is contingent upon his/her privacy perceptions and willingness to control his/her own privacy, as well as the extent to which media technology requires personal information from media users or allows users to control their own privacy. The concept of privacy proposed by Westin is deemed suitable for the present study as it examines how adolescents perceive and manage privacy in the new media environment.

Privacy, conceptualized as one's right to manage his or her personal information, has become one of the most important issues in the field of communication with the emergence of the Internet as an enabler of synchronous and immediate exchange of information among communication participants (Jiang, Heng, & Choi, 2013). Being interactive in nature, websites and online applications encourage users' active input and self-disclosure. For instance, Internet users are often required to reveal and share personal information when they use online services, join online groups, or shop online (Galegher, Sproull, & Kiesler, 1998; Metzger, 2006). Users also voluntarily disclose personal information to reduce mutual uncertainty in computer-mediated communication (Tidwell & Walther, 2002) and to enrich online communication and social networking experiences (Feng & Xie, 2014; Jiang et al., 2013; Taraszow, Aristodemou, Shitta, Laouris, & Arsoy, 2010).

Online communication is a major activity for today's adolescents, and as stated earlier, their information disclosure is fairly common on the Internet. Furthermore, adolescents have purchasing power and substantially influence adult purchases made from

their homes (Friedman, 2000). Thus, they are viewed as an important consumer segment by marketers, especially in the online environment (Lindstrom & Seybold, 2003). Encouraged by the ability of the Internet to attract adolescents, marketers have developed a wide range of strategies to reach and appeal to online adolescents (Montgomery & Chester, 2009). To reach the right target in the right context, marketers collect personal information from young Internet users by using collection tools such as cookie placing, location-based advertising, and behavioral targeting (Feng & Xie, 2014). Marketers also encourage adolescent consumers to disclose more personal information in exchange for enhanced online communication experiences (Youn, 2008).

Based on our study's adopted definition of privacy that focuses on one's ability to control personal information, consumers' privacy is likely to be significantly compromised when their personal information is taken out of their control, such as when marketers collect information unbeknown to the consumers or use information beyond the original purposes initially informed to them (Nowak & Phelps, 1995). Thus, the invasion of privacy can be a serious issue when adolescents do not know, or do not attempt to know, how and by whom their information is collected and analyzed. For instance, SNS users do not tend to read privacy policies carefully when they register for the SNS services (Ou, 2011). Such disregard of personal information usage and protection is likely to result in lower levels of privacy concerns and excessive personal information disclosure among Internet users. Likewise, online risks can increase when adolescents are not fully aware of the fact that their personal information is being collected and utilized for unknown purposes (Feng & Xie, 2014). Types of risks that adolescents can be exposed to when they fail to control own personal information online include, but are not limited to, cyberbullying, online stalking, identity theft, and exposure to unwanted or inappropriate advertising content (Moscardelli & Divine, 2007; Youn, 2008; Trepte & Reinecke, 2011).

The role of adolescents as both consumers and Internet users makes it important to examine adolescents' online privacy-related perceptions and behaviors, and the factors influencing them. This study examines parental practices and parent-adolescent communication, as well as the way adolescents' use the Internet as potential influencers of adolescents' privacy concerns and information disclosure online.

## ***2.2. Parental Mediation***

Parents play an important role in the process through which young people acquire and develop social attitudes and behaviors (John, 1999). As primary caregivers, parents take care of their children and teach them what is considered right and wrong in society. Parents transfer knowledge and skills to their children through modelling, reinforcement, and social interactions (Laible & Thompson, 2007). Parents also control resources available to children and manage the environment to protect children from any harmful social influences (Grusec & Davidov, 2007), including potentially negative effects of adolescents' Internet use (Mesch, 2009; Livingstone & Helsper, 2008; Lwin, Stanaland, & Miyazaki, 2008).

Parental mediation research focuses on the role of parents as socialization agents in youngsters' media consumption (Clark, 2011). Parental mediation refers to strategies that parents employ to control and supervise their child's media use (Warren, 2001). Parental mediation theory acknowledges that children can be affected by their exposure to media, but that such media effects can be mediated or mitigated by the extent to which parents are involved in monitoring and supervising children's media use (Mesch, 2009). This theory overarches both mass media and interpersonal communication in that it examines how the degree to which mass media affect children is influenced by parent-child communication and interaction (Clark, 2011).

Two broad dimensions of parental mediation have been examined in parental mediation research: restrictive mediation and instructive mediation (Lwin et al., 2008).



Restrictive mediation refers to parents' limiting children's access to media or setting rules in terms of appropriate media content and the amount of media exposure permitted. It is called "restrictive" mediation because it is based on parental decision to restrict children's exposure to media. Instructive mediation, also known as "active mediation" or "evaluative mediation," refers to parents' explaining and discussing undesirable aspects of media consumption and suggesting proper ways to use media. It involves communication between parents and children about media and parental efforts to help children understand the nature of media messages (Clark, 2011; Fujioka & Austin, 2003; Valkenburg et al., 2013).

Parental mediation literature suggests that instructive mediation is more effective than restrictive mediation in reducing undesirable media influences on children (see Valkenburg et al., 2013 for review). It is because instructive mediation is based on conversation and critical discussion between parents and children, which is more likely than control-based restrictive mediation to cultivate critical thinking skills and skepticism in children (Fujioka & Austin, 2003). In the adolescents' Internet use and online privacy context, in particular, past studies have demonstrated that instructive mediation is positively associated with adolescents' concerns about the way online marketers collect personal information (Youn, 2008), and negatively associated with their willingness to disclose personal information on commercial websites (Lwin et al., 2008).

This does not mean that restrictive mediation has no impact on adolescents. In fact, studies have demonstrated that restrictive mediation can be effective in reducing risks associated with adolescents' Internet use. Livingstone and Helsper (2008) and Mesch (2009) found that parents' restrictions on teens' use of the Internet for interpersonal interactions functioned to lower teens' involvement in such proscribed activities. However, literature has also suggested that too much restriction could cause boomerang effects, especially when it is imposed on adolescents with heightened needs for autonomy. Lwin et al. (2008)

demonstrated a negative association between restrictive mediation and adolescents' intention to disclose personal information online. Similarly, Sasson and Mesch (2014) found that restrictive mediation was positively associated with adolescents sending an insulting message, posting personal details, and meeting face-to-face with online strangers.

In sum, the literature clearly suggests that instructive mediation works better than restrictive mediation in reducing risks associated with adolescents' Internet use. Discussion-based instructive mediation can lead adolescents to be more responsive to parental comments and be more critical about media practices, including marketers' collection of personal information from adolescents (Valkenburg et al., 2013; Youn, 2008). On the other hand, restrictive mediation imposed on adolescents can cause psychological reactance due to adolescents' increasing pursuit of independence and their resistance to parental authority (Sasson & Mesch, 2014; Valkenburg et al., 2013). Hence, we pose the following hypothesis:

- H1. Instructive mediation will be more effective than restrictive mediation in a) *increasing* concerns about online privacy and b) *decreasing* online information disclosure among adolescents.

### ***2.3. Parental Knowledge and Child Self-Disclosure***

The majority of research studies examining the role of parents in children's media use has focused on "what parents do to their children," rather than "what children do to their parents." However, youth socialization is not a one-way street in that it involves "a constant process of reciprocal interchange that leads to constant transformation of interactions" (Grusec & Davidov, 2007, p. 286). Therefore, "what children do to their parents" also deserves careful consideration. Guided by parental knowledge theory (Kerr & Stattin, 2000), the present study also examines the role of adolescents' self-disclosure to their parents.

Past studies have shown that higher levels of parental knowledge about adolescents' whereabouts are negatively associated with maladjustments and risky behaviors in

adolescents (Crouter, Bumpus, Davis, & McHale, 2005; Kerr & Stattin, 2000; Snyder, Dishion, & Patterson, 1986). Kerr and Stattin (2000) identified three key sources of parental knowledge: child disclosure (a child's free and willing disclosure of information to parents), parental control (parental efforts to control adolescents' freedom without explaining about parental rules and restrictions), and parental solicitation (a parent's gathering information about their children by asking children themselves or others). While all three sources have been found to contribute to parental knowledge (Crouter et al., 2005; Kerr & Stattin, 2000; Waizenhofer, Buchanan, & Jackson-Newsom, 2004), past studies strongly suggested that child disclosure is the best source of parental knowledge (Kerr & Stattin, 2000). Child disclosure has also been found to be a significant predictor of adolescents' good adjustments, whereas adolescents' keeping of secrets from their parents predicted negative outcomes such as a lower self-esteem and a more depressive mood (Frijns, Finkenauer, Vermulst, & Engels, 2005; Kerr & Stattin, 2000).

Although the literature on parental knowledge (Crouter et al., 2005; Kerr & Stattin, 2000; Snyder et al., 1986) strongly suggested that adolescents' voluntary disclosure to parents about their behaviors would lead to positive socialization outcomes, little is known regarding the impact of adolescent disclosure to parents on their online behaviors. Law, Shapka, and Olson (2010) showed that adolescents' self-disclosure of online behavior to their parents was negatively associated with online aggression. However, to the best of our knowledge, no study has examined the role of adolescents' disclosure of online behaviors to their parents in the context of online privacy concerns and information disclosing behaviors. In an effort to add to the parental knowledge literature, we pose the following research question:

RQ1. How is adolescents' disclosure to their parents of what they see on the Internet associated with their online privacy concerns and information disclosure?

Sasson and Mesch (2014) argued that restrictive mediation is similar to the notions of “control” and “solicitation” in parental knowledge theory in that restrictive mediation involves parental control over children’s activities and intrusion of child autonomy. On the other hand, instructive mediation was viewed as similar to “child disclosure” as both support children’s autonomy and parent-child communication. The similarities in the notions and findings from each stream of research (parental mediation and parental knowledge) seem to further support why instructive mediation, which is “autonomy-supportive” (Valkenburg et al., 2013), tends to work better than restrictive mediation, which is “control-based” (Valkenburg et al., 2013), especially when imposed on adolescents with growing pursuit of autonomy. However, Sasson and Mesch (2014) did not empirically test the relationship between parental mediation and sources of parental knowledge. To advance our understanding of both parental mediation and parental knowledge, this study tests the relationship between parental mediation and child disclosure by posing the following research question:

RQ2. How is parental mediation associated with adolescents’ disclosure to their parents of what they see on the Internet?

#### ***2.4. Internet Influence***

Another important factor affecting young people’s social attitudes and behaviors is media (John, 1999). Dubow, Huesmann, and Greenwood (2007) argued that media can provide “learning opportunities that socialize children, and what children observe through the mass media’s window on the world alters their beliefs, attitudes, and behaviors” (p. 408). Considering that today’s youths are exposed to tremendous amounts of media messages daily, media is one of the primary information sources that transmit norms and values to youths, and affect the way youths learn about the world and build self-identities and forge social relationships.

Socialization through traditional media (i.e., television) has been found to entail both positive and negative outcomes. While some scholars have demonstrated that television viewing helps adolescents acquire marketplace knowledge and develop consumer skepticism (Mangleburg & Bristol, 1998; Moschis, 1978), others have found positive associations between adolescents' television viewing and negative socialization outcomes such as higher levels of materialism (Moschis & Churchill, 1978).

In the online communication context, Internet use has been found to be more of a negative than a positive influence. Livingstone and Helsper (2008) revealed that the frequency of teens' Internet use was positively associated with their exposure to various types of online risks, including access to inappropriate content and information disclosure. Shin, Huh, and Faber (2012a) also demonstrated that the amount of time tweens (aged 9-12) spent on the Internet was positively associated with their willingness to disclose personal information online. Moscardelli and Listin-Heyes (2005) found a negative association between teens' time spent on the Internet and their skepticism toward advertising.

Regarding the negative association between teens' Internet use and advertising skepticism, Moscardelli and Listin-Heyes (2005) explained that heavy reliance on the Internet and active engagement in online activities could have contributed to the development of overall positive feelings and trust towards the Internet. Shin et al. (2012a) provided empirical support for Moscardelli and Listin-Heyes' postulation by demonstrating that a positive association between the amount of time tweens spent on the Internet and their favorable attitudes toward online advertising existed.

Overall, research literature suggests that Internet use is likely to lead to a more positive attitude toward, and a heightened trust in, the Internet. This may lower adolescents' skepticism toward the Internet, leading them to be less critical about how they are targeted by marketers and how their information is collected and used online, and thus, to take higher

risks by disclosing more personal information online. Therefore, we pose the following hypothesis:

H2. The amount of time adolescents spend on the Internet and their engagement in online communication activities will be a) *negatively* associated with concerns about online privacy and b) *positively* associated with information disclosure online.

### **3. Methods**

#### ***3.1. Participants and Procedure***

A survey was conducted with 746 adolescents aged 12-18 recruited from four different secondary schools located in different parts of Singapore to represent diverse socioeconomic and geographic segments of adolescents in the country. Prior to conducting the survey, the survey instruments were reviewed and approved for use by the Institutional Review Board (IRB) of the principal investigator's institution and by each participating secondary school.

Parents were informed of the objective and procedure of the survey, and parental permission was sought prior to the adolescents' participation. Students with parental permission filled out a self-administered paper-and-pencil survey either in their classrooms or school halls. Before filling out the survey questionnaire, participating students read and signed an assent form and were informed that their participation was voluntary and their responses would be anonymous. One of the authors and her research assistants were present during the survey sessions, and the participants were encouraged to ask questions if they were not sure about any items in the questionnaire. Each participant was given a S\$5 gift voucher (equivalent to US\$4) upon completion of the survey as a token of appreciation.

A total of 847 parental consent forms were sent to parents, and 746 students with parental permission participated and completed the survey, resulting in a response rate of

88%. The final sample ( $N = 746$ ) consisted of 52% male, with a mean age of 14.3 ( $SD = 1.32$ ). Sixty percent were 12-14 years old and the rest were aged 15-18.

### 3.2. Measures

*Privacy concerns* were measured by asking respondents the extent they were concerned about different aspects of online privacy on three 5-point Likert scales, anchored on “strongly disagree” (1) to “strongly agree” (5). The items were adapted from Pew Internet’s Teens’ Privacy Survey (2012). The composite scale of privacy concerns was created by averaging the three item scores.

To measure *information disclosure*, both *behavioral intention* and *actual disclosing behavior* were assessed. *Behavioral intention* was measured by asking whether respondents were willing to provide each of the 11 types of personally identifiable information (PII) upon request by websites that they may visit (real name, home address, email address, phone number, age, gender, school name, a photo of myself, Internet ID/screen name, national identification number, and hometown). The PII items were adopted from the suggested list of PII provided by the Children’s Online Privacy Protection Act (COPPA) guidelines ([www.coppa.org](http://www.coppa.org)). The composite scale of *willingness to disclose PII* was computed by counting the number of PII items the respondents were willing to disclose when requested. *Actual disclosing behavior* was measured by asking respondents how often respondents “send personal information to someone that they had never met face to face,” “send a photo or video of themselves to someone that they have never met face to face,” and “share their Internet password with friends.” The items were adapted from EU Kids Online survey (Livingstone et al., 2011) and measured on a 5-point scale anchored on “never” (1) to “always” (5). Internal reliability of the three-item measurement (Cronbach’s  $\alpha = .60$ ) was slightly low but still considered acceptable (George & Mallery, 2003). Thus, the composite scale of *actual information disclosure* was created by averaging the three item scores.

*Restrictive mediation* was measured by asking respondents to rate how often their parent/guardian who spent the most time with them at home controlled and monitored their Internet use. Nine items adapted from prior research on parental mediation (Lee & Chae, 2012; Livingstone et al., 2011; Livingstone & Helsper, 2008) were measured on a 5-point Likert scale, anchored on “never” (1) to “always” (5). Item scores were averaged to create the composite scale of restrictive mediation.

*Instructive mediation* was measured by asking respondents to indicate whether their parent/guardian who spent the most time with them at home had helped on or talked about proper ways of using the Internet. Six items adapted from prior research on parental mediation (Lee & Chae, 2012; Livingstone et al., 2011) were rated using a “yes” (1) or “no” (0) dichotomous format, and the number of “yes” was counted to create the composite scale of instructive mediation.

*Adolescents' disclosure to parents* was measured by asking how often they talk to parents about what they have seen on the Internet, anchored on “never” (1) to “always” (5).

*Time spent on the Internet* was measured by asking respondents to indicate the amount of time they spent on the Internet per day (hours and minutes).

*Engagement in online communication activities* was assessed by asking respondents to report how often they play online games with other people on the Internet, visit a social networking site, and chat with people online, using a 5-point Likert scale anchored on “never to almost never” (1) to “always” (5).

Table 1 displays the descriptive statistics for the measurements used in this study.

*Table 1 is about here*

#### **4. Results**

Bivariate correlations were calculated to examine the associations between the variables and to detect multicollinearity in the dataset. As presented in Table 2, none of the



variables were found to be strongly correlated (i.e.,  $r < .70$ ) (Howell, 2002). Thus, the issue of multicollinearity did not arise.

*Table 2 is about here*

The correlation matrix indicates that restrictive mediation is negatively associated with adolescents' willingness to disclose personally identifiable information (PII) ( $r = -.09, p < .05$ ) but positively associated with actual information disclosure ( $r = .09, p < .05$ ). On the other hand, instructive mediation was found to be negatively associated with both willingness to disclose PII ( $r = -.12, p < .01$ ) and actual information disclosure ( $r = -.10, p < .01$ ). However, none of the parental mediation variables showed any significant association with privacy concerns. While this partially supported H1, hierarchical regression analyses were needed to assess whether the findings still hold even after controlling for adolescent demographic characteristics. Findings from the regression analyses are reported later.

RQ1 asked how adolescents' disclosure of what they see on the Internet to their parents is associated with their online privacy concerns and information disclosure. Table 2 shows that adolescents' disclosure to parents was significantly and positively associated with online privacy concerns ( $r = .16, p < .01$ ), but not with the behavioral outcomes.

The correlation matrix also displayed how parental mediation and adolescents' disclosure to parents were associated, providing an answer to RQ2. Adolescents' disclosure to parents was positively related to both instructive ( $r = .30, p < .01$ ) and restrictive mediation ( $r = .18, p < .01$ ). To test if the correlation coefficients were significantly different, the correlation coefficients (.30 and .18) were compared, using Fisher's  $r$  to  $z$  transformation formula below.

$$Z = \frac{r_1' - r_2'}{\sqrt{\frac{1}{n_1 - 3} + \frac{1}{n_2 - 3}}}$$

Computation revealed that the correlation between adolescents' disclosure and instructive mediation was significantly different from the correlation between adolescents' disclosure and restrictive mediation ( $z = 2.36, p < .05$ ). In other words, adolescents' self-disclosure to parents was more closely related to instructive mediation than restrictive mediation.

The correlation matrix also showed that the Internet factors examined tended to have a positive association with information disclosure online. Time spent on the Internet was positively associated with adolescents' willingness to disclose PII ( $r = .12, p < .01$ ) as well as actual information disclosure ( $r = .16, p < .01$ ). While social networking site use was positively associated with adolescents' willingness to disclose PII ( $r = .19, p < .01$ ), online game playing and online chatting were found to be positively associated with actual information disclosure ( $r = .21, p < .01$  for online game playing;  $r = .13, p < .01$  for online chatting). Privacy concerns were significantly associated with online chatting ( $r = .11, p < .01$ ), but the association was positive, which was opposite to what H2 had predicted.

Adolescents' online privacy concerns were not significantly associated with the two behavioral outcomes—willingness to disclose PII ( $r = .03, p > .05$ ) and actual information disclosure ( $r = .00, p > .05$ ), suggesting that concerns may not necessarily lead to cautious online behavior among adolescents. On the other hand, the two behavioral outcomes were positively associated with each other ( $r = .18, p < .01$ ), implying that those with higher intention to disclose PII are more likely to disclose sensitive personal information online.

To further examine the effects of parent and Internet factors on online privacy perceptions and behaviors (H1, RQ1, and H2), while controlling for participants' age and gender, three separate regression analyses were conducted. For each analysis, control variables (age and gender) were entered into the first block, followed by Internet (block 2) and parent factors (block 3). The analysis results are presented in Table 3.

*Table 3 is about here*

Instructive mediation emerged as a negative predictor of adolescents' willingness to disclose PII ( $\beta = -.10, p < .05$ ) and actual privacy disclosure ( $\beta = -.12, p < .01$ ). However, restrictive mediation was not significantly associated with willingness to disclose PII. Moreover, restrictive mediation was found to be a positive predictor of actual information disclosure ( $\beta = .14, p < .01$ ). Confirming what the correlation analysis (Table 2) had revealed, the results suggest that (1) instructive mediation is more effective than restrictive mediation in reducing privacy risks and (2) restrictive mediation can cause a boomerang effect (i.e., more information disclosure). However, neither restrictive mediation nor instructive mediation was associated with adolescents' concerns about online privacy. Altogether, H1 was supported for the behavioral outcomes (H1b), but not for the perceptual outcome (H1a).

Consistent with what correlation analysis had revealed, adolescents' self-disclosure to their parents about their online experiences was significantly and positively associated with their privacy concerns ( $\beta = .17, p < .01$ ), but not with the two behavioral outcomes, answering RQ1.

For Internet influences, different outcomes were predicted by different Internet usage factors. Privacy concerns were predicted by online chatting ( $\beta = .12, p < .01$ ). That is, the more adolescents chat with people online, the more likely they would be concerned about online privacy, which is opposite to what H2a had predicted. Adolescents' willingness to disclose PII was predicted by social networking site visit ( $\beta = .13, p < .01$ ), whereas actual information disclosure was more a function of the amount of time spent on the Internet ( $\beta = .13, p < .01$ ) and online game playing ( $\beta = .15, p < .01$ ), which is in line with H2b. Overall, H2 was supported for the behavioral outcomes (H2b) only.

Of the two control variables, age was positively associated with all three dependent variables ( $\beta = .10, p < .05$  for privacy concerns;  $\beta = .16, p < .01$  for willingness to disclose PII;

$\beta = .11, p < .01$  for actual information disclosure), suggesting that older adolescents tend to have greater concerns about online privacy, but they also tend to disclose more personal information online. Gender was associated with willingness to disclose PII online ( $\beta = -.09, p < .05$ ). Specifically, boys were more likely than girls to disclose PII upon request.

The significant  $R^2$  increments from step 1 to step 2 in all three regression models indicated that media play an important role in adolescents' online privacy concerns and information disclosure. The introduction of parent-child relationship factors to block 3 significantly increased the total variance of online privacy concern and actual information disclosure, but not the variance in willingness to disclose PII.

## **5. Discussion and Conclusion**

This study investigated the role of parental and the Internet factors in adolescents' online privacy-related perceptions and behaviors. Specifically, parental mediation, adolescents' self-disclosure to parents about their Internet experiences, time spent on the Internet, and engagement in online communication activities were examined as factors that may impact adolescents' online privacy concerns, willingness to disclose personally identifiable information (PII), and actual information disclosure.

With regard to parental mediation, the results suggest that instructive mediation is more effective than restrictive mediation in reducing privacy risks. Instructive mediation was found to be negatively associated with both the intention and actual disclosure of personal information, whereas restrictive mediation was positively associated with actual information disclosure. These findings are consistent with what previous studies have reported (e.g., Lwin et al., 2008; Sasson & Mesch, 2014; Youn, 2008), suggesting that autonomy-supportive parenting (i.e., instructive mediation) is a better solution than control-based parenting (i.e., restrictive mediation), especially for parents of adolescents with growing pursuit of autonomy (Fujioka & Austin, 2003; Valkenburg et al., 2013).

According to self-determination theory (SDT, Ryan & Deci, 2000), parental practices supporting children's autonomy through interpersonal involvement tend to facilitate children's perceptions that their decision to follow parental expectations is self-determined rather than externally forced. Such perceptions increase children's tendency to be more responsive to parents and internalize behaviors prescribed by parents, even when a reward for the pro-social behaviors is not clearly present (Grusec & Davidov, 2007). When parents employ restrictive methods to control adolescents' Internet use without mutual discussion, however, the locus of control is situated in parents, not in adolescents. Under such circumstances, adolescents are likely to feel that their personal control is compromised by parental control (Kerr & Stattin, 2000). This can result in reactance effects such as boomerang effects (Lwin et al., 2008) and forbidden fruit effects (Cantor & Wilson, 2003), leading adolescents to be more attracted to what parents define as "undesirable" behaviors. Especially considering that adolescents tend to perceive Internet use as a personal activity, their resistance to parental mediation is likely to be greater when more control-based mediation is imposed on their Internet use (Valkenburg et al., 2013).

While the *behavioral* outcomes (willingness to disclose PII & actual information disclosure) were predicted by what parents do to mediate and mitigate Internet influence on adolescents (parental mediation), the *perceptual* outcome (privacy concerns) was found to be more a function of what adolescents do to their parents (self-disclosure to parents). Specifically, our results indicated that adolescents who frequently talked to their parents about their online experiences tended to have heightened privacy concerns. Given that heightened privacy concerns may reflect heightened awareness of issues related to online privacy, which is considered a positive media socialization outcome (Youn, 2008), our finding corroborates what previous studies on parental knowledge theory have found: Child self-disclosure to parents is linked to positive outcomes (Frijns et al., 2005; Kerr & Stattin,

2000). Based on our findings and insights gained from prior research on parental knowledge, parents are encouraged to engage in open communication so that adolescents feel like they can freely talk to their parents about what they see or experience on the Internet, which, in turn, would enhance adolescents' awareness of online privacy and pertinent issues.

Our study also explored the relationship between parental mediation and parental knowledge variables. While the parental knowledge variable examined in this study (self-disclosure to parents) was found to be significantly associated with both restrictive and instructive mediation, Fisher's  $r$  to  $z$  transformation revealed that self-disclosure to parents is more closely related to instructive mediation than to restrictive mediation, supporting Sasson and Mesch's (2014) aforementioned argument. However, the present study did not examine other sources of parental knowledge (i.e., parental control and solicitation). Future research might consider examining various types of parental knowledge sources in relation to parental mediation and its outcomes.

In addition to parental influence, the present study shed light on the impact of Internet usage. Our results suggest that adolescents' Internet use plays both positive and negative roles. The amount of time adolescents spent on the Internet and their involvement in online communication via games and social networking sites were positively associated with information disclosure online. On the other hand, online chatting was found to be positively associated with heightened privacy concerns after controlling for demographic variables. Given that online chatting tends to take place in more private settings than social networking or online games, adolescents may perceive privacy intrusion in one-on-one online chatting situations to be more alarming and invasive than in peer-to-peer or group-to-group social networking or online gaming situations. Such negative experiences expected in chatting rooms may heighten adolescents' concerns about online privacy. When adolescents participate in social networking or online gaming, on the other hand, they may feel that

personal information sharing is necessary in order to enrich social networking/gaming experiences and strengthen social ties with peers. This may lead adolescents to be less cautious about information disclosure when engaging in social networking or online gaming.

In addition to autonomy, SDT poses that *relatedness* (i.e., the desire to feel connected to others) plays an important part in one's psychological growth and wellbeing (Deci & Ryan, 2000). Adolescence is the time when peer relatedness becomes increasingly important (Beiswenger & Grolnick, 2010). The emerging needs for peer relatedness can have substantial influence on adolescents' social behaviors, including online information management. Our findings suggest that peer-to-peer online social interactions, which is one of the most important activities for adolescents to nurture own wellbeing, may result in careless online information management. Further research is encouraged to identify and examine factors affecting youths' privacy perceptions and information protection behaviors in different communication contexts across divergent communication platforms. Studies that examine how adolescents' attachment to and relationships with their peers influence the way they manage online privacy will be particularly useful.

Unexpected but interesting findings are: (1) Adolescents' privacy concerns are not associated with their information disclosing behavior; (2) While adolescents' self-disclosure to parents was associated with online privacy concerns, it was not associated with the behavioral outcomes; and (3) While parental mediation perceived by adolescents (especially instructive mediation) was associated with the behavioral outcomes (willingness to disclose PII and actual information disclosure), it was not associated with the perceptual outcome (privacy concerns).

Although the first unexpected finding (no significant association between online privacy concerns and information disclosing behaviors) was not a part of our hypothesis testing, it deserves closer attention as it appears to be counterintuitive at a glance. The finding

can be explained by the notion called “privacy paradox” (Barnes, 2006), which suggests that while Internet users are concerned about their privacy online, such concerns do not necessarily result in more information protection. Such a paradox can arise when Internet users are not fully aware of the consequences of information disclosure (i.e., how their information will be used by others and what information disclosure entails) (Milne & Culnan, 2004) or ways to protect personal information (Debatin, Lovejoy, Horn, & Hughes, 2009). In addition to the lack of awareness or knowledge, Taddicken (2014) suggested that “a social norm or perceived pressure to reciprocate by revealing personal details within the social web” (p. 267) can contribute to privacy paradox. That is, Internet users are expected to disclose some extent of personal information, and they may reveal more personal information when they perceive other Internet users also disclose extensive personal information. Adolescents may disclose personal information to socialize with and be accepted by their peers sharing divergent types of information online. Future research should examine various types of social (e.g., perceived peer and social norms) and individual factors (knowledge and awareness of online privacy issues) that can explain this privacy paradox.

The second and third unexpected findings imply that different parental practices are associated with different socialization outcomes. Based on these findings, we suggest that parents should consider using specific strategies to achieve different goals of media socialization. If parents aim to heighten their adolescent children's awareness of online privacy and develop critical thinking skills on that topic, parents are encouraged to stimulate open communication with adolescents so that adolescents will more willingly talk to their parents about their online experiences. However, adolescents' self-disclosure to parents and parents' listening to adolescents alone may not be sufficient to influence adolescents' information disclosing *behaviors*. Behaviors are likely to be affected when parents make specific comments on the pros and cons of the Internet and have more focused discussions



about proper ways of using the Internet (i.e., instructive mediation). For both a heightened awareness of online privacy and a more cautious online behavior, the key appears to be a two-way, autonomy-supportive communication rather than a one-way rule-making and controlling.

A limitation of this study is that our data reflected adolescents' standpoints only, without accounting for parents' perspectives. Prior studies have suggested that parents tend to overestimate the effectiveness of control over their children and underestimate their children's engagement in negative social behaviors (Cho & Cheon, 2005). Because children are the objects of parental mediation, data collected from children may offer more precise insights into parental practices. Nonetheless, we acknowledge that dyadic surveys involving both parents and children would provide richer insights into the subject matter. For instance, the degree to which parents and adolescents agree or disagree about the level of parental mediation imposed on children can be a factor that may affect parental mediation effects and effectiveness (Shin, Huh, & Faber, 2012b). Also, we measured adolescents' talking to parents about the Internet *in general* when assessing child self-disclosure to parents. Future research might look at adolescent disclosure in more specific communication contexts across different media usage situations (e.g., talk to parents about what they experienced in social networking sites, chatting sites, game sites, etc.). Future research taking both parents and adolescents' views on parental practices and parent-adolescent relationships, and their influences on adolescents' perception and behavior pertaining to online privacy protection should be considered.

In addition, this is a cross-sectional study conducted in a single country. Parenting practices in each country are often bound to culture and can be influenced by the country's socio-economic status (John, 1999; Sonck, Nikken, & de Haan, 2013). Singapore is a developed country with high Internet and mobile penetration rates. The country places great

emphasis on interdependence of family members but less emphasis on children's autonomy (Stright & Yeo, 2014). Some of our findings may be more applicable to collectivistic countries with high levels of Internet or mobile penetration (e.g., South Korea, Japan, and Hong Kong), but not directly applicable to developing countries with lower Internet or mobile penetration rates or countries placing greater emphasis on the development of individualism. Therefore, we call for caution when interpreting and projecting the findings of this study to other culturally and socio-economically different research contexts.

Despite these limitations, this study has important contributions as it examined not only what parents do to their adolescent children (parental mediation) but also what adolescents do to their parents (self-disclosure to parents) as potential influencers of privacy perceptions and behaviors. While adolescent self-disclosure and parental mediation were found to be closely related, the former had a greater influence on privacy perceptions (privacy concerns) whereas the latter had more influence on the behavioral outcomes (intention and actual disclosure of personal information). Our results also suggest that control-based parental practices (restrictive mediation) could result in reactance effects when imposed on adolescents. These findings provide practical implications for parents and educators, suggesting that media education and mediation require careful consideration of the target groups' developmental stages (e.g., adolescence), as well as goals of media socialization (e.g., increasing awareness vs. affecting behaviors).

It is important to address that our results confirm what was previously found with respect to the effects and effectiveness of instructive mediation across different populations of children, adolescents, and parents. As mentioned earlier, Singapore may deviate from non-Asian, individualistic counterparts in terms of cultural values and parenting practices. Extensive research has confirmed that Asian parents are relatively more restrictive than American or European parents (see Chao & Tseng, 1995). In most parts of Asia, including

Singapore, parental authority is strongly endorsed, and children are expected to conform to parents (Chao & Tseng, 1995). Nonetheless, our study revealed that autonomy-supportive communication-based instructive mediation works better than controlling and rule-based restrictive mediation in Singapore. This provides another evidence for the relative success and effectiveness of instructive mediation over restrictive mediation found in different cultural and social contexts.

Additionally, this study examined various Internet factors as potential influencers of adolescents' online privacy perceptions and behaviors. While prior studies have demonstrated that higher levels of the Internet use in general can increase the chance that adolescents engage in risky online behaviors (Livingstone & Helsper, 2008; McAfee, 2012), little has been known regarding which type of online activities increases or decreases privacy risks among adolescents. Our study revealed that different online communication activities predict different online privacy-related perceptions and behaviors. While online chatting was found to be positively related to privacy concerns, social networking and online gaming were found to increase privacy disclosure intention and behaviors. The findings can provide parents and policy makers with clearer insights into risks residing in different online communication platforms, and thereby help them to have a more focused communication with adolescents on the issues related to online privacy and to develop more effective guidelines for online youths.

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Table 1. Measurement items and statistics

Constructs and Items	Mean	SD	Cronbach's alpha ( $\alpha$ )
Privacy concerns	3.51	.76	.63
<ul style="list-style-type: none"> <li>• <i>I am concerned about the way certain websites or companies collect and use my personal information online.</i></li> <li>• <i>While online, I feel like I am being asked to provide large amounts of personal information.</i></li> <li>• <i>I am concerned that a company will track me down</i></li> </ul>			
Willingness to disclose PII	4.46	2.05	-
<i>Think about the websites that you or your friends may visit. Some websites want you to provide personal information for registration, membership, or for other different reasons. Overall, what kinds of information do you think you can provide to those websites? Please check all that apply.</i>			
Actual information disclosure	1.32	.53	.60
<ul style="list-style-type: none"> <li>• <i>I send personal information (e.g., my name, address, phone number) to someone that I have never met face-to-face.</i></li> <li>• <i>I send a photo or video of myself to someone that I have never met face-to-face.</i></li> <li>• <i>I share my Internet password with my friend.</i></li> </ul>			
Restrictive mediation	2.12	.84	.89
<i>My parents/guardians spending most time with me at home...</i>			
<ul style="list-style-type: none"> <li>• <i>Determines which websites I can or can't visit</i></li> <li>• <i>Determines the time of the day I can use the Internet</i></li> <li>• <i>Limits the amount of time that I can use the Internet</i></li> <li>• <i>Sits with me when I use the Internet</i></li> <li>• <i>Stays nearby when I use the Internet</i></li> <li>• <i>Checks or demands to know which websites I have visited</i></li> <li>• <i>Demands to know whom I chat with or friend with online</i></li> <li>• <i>Limits the kinds of information I can disclose on the Internet</i></li> <li>• <i>Checks the messages in my email, instant messaging, or social networking site account</i></li> </ul>			
Instructive mediation	2.19	2.11	.83
<i>My parents/guardians spending most time with me at home...</i>			
<ul style="list-style-type: none"> <li>• <i>Explains why some websites are good or bad</i></li> <li>• <i>Suggests ways to use the Internet safely</i></li> <li>• <i>Talks to me about what kinds of things should or should not be shared online</i></li> <li>• <i>Talks to me about what I would do if someone on the Internet ever bothered me</i></li> <li>• <i>Recommends good websites for me or people of my age</i></li> <li>• <i>Helps me when something is difficult to do or find on the Internet</i></li> </ul>			
Adolescents' disclosure to parents			
<ul style="list-style-type: none"> <li>• <i>How often do you talk to parents about what you have seen on the Internet?</i></li> </ul>	2.37	1.14	-
Time spent on the Internet (minutes per day)	216.25	164.05	-
Playing a game with other people on the Internet	2.67	1.37	-
Visiting a social networking site like Facebook	4.04	1.12	-
Chatting with people in a chatroom or using an instant messengers	3.22	1.53	-

Table 2. Zero-order correlations between variables

	1	2	3	4	5	6	7	8	9	10
1. Time spent on the Internet	1									
2. Playing online games with others	.24**	1								
3. Visiting social networking sites	.29**	.11**	1							
4. Chatting with people online	.20**	.17**	.38**	1						
5. Restrictive mediation	-.20**	.00	-.17**	.02	1					
6. Instructive mediation	-.10**	-.06	-.03	-.03	.30**	1				
7. Adolescents' disclosure to parents	.01	-.12**	-.02	-.05	.18**	.30**	1			
8. Privacy concerns	.00	-.02	.09	.11**	.06	.05	.16**	1		
9. Willingness to disclose PII	.12**	.05	.19**	.06	-.09*	-.12**	-.03	.03	1	
10. Actual information disclosure	.16**	.21**	.08	.13**	.09*	-.10**	.05	.00	.18**	1

\* $p < .05$ , \*\*  $p < .01$  (2-tailed)

Table 3. Hierarchical regression for predicting privacy concerns and information disclosure

Variables	Privacy concerns			Willingness to disclose PII			Actual information disclosure		
	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$	<i>B</i>	<i>SE</i>	$\beta$
Step 1: Demographic (control) variables									
Age	.06	.02	.10*	.24	.06	.16**	.04	.01	.11**
Gender (1= male, 2 = female)	.04	.06	.03	-.35	.17	-.09*	.01	.04	.01
$R^2 (\Delta R^2)$		.01 (.01)			.04 (.04)			.01(.01)	
Step 2: Adolescent's Internet use									
Time spent on the Internet	.00	.00	-.07	.00	.00	.06	.00	.00	.13**
Playing online games with others	.02	.02	.03	.01	.07	.01	.05	.02	.15**
Visiting social networking sites	.04	.03	.06	.23	.08	.13**	.01	.02	.03
Chatting with people online	.06	.02	.12**	.04	.06	.03	.02	.01	.08
$R^2 (\Delta R^2)$		.03* (.02)			.07** (.03)			.07** (.06)	
Step 3: Parent-adolescent relationship									
Restrictive mediation	.02	.04	.03	-.03	.10	-.01	.08	.02	.14**
Instructive mediation	.00	.02	.00	-.10	.04	-.10*	-.03	.01	-.12**
Adolescent's disclosure to parents	.11	.03	.17**	.03	.08	.02	-.01	.02	-.01
$R^2 (\Delta R^2)$		.06 ** (.03)			.08 (.01)			.10** (.02)	

\* $p < .05$ , \*\*  $p < .01$ \*, \*\* for  $R^2$  indicates significance of  $R^2$  increments.