



# Longitudinal Changes of Parents' Views on Risky Online Behaviors and Positive Technological Development Among Hong Kong Early Adolescents

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**Abstract.** This study explored longitudinal changes of parents' views on risky online behaviors and positive technological development (PTD) of early adolescents in Hong Kong. Data were collected through semi-structured interviews with nine parents (four fathers and five mothers) from five families with adolescent children from five secondary schools at two time points, with a 1-year interval. The adolescent children of the parents were all male with different academic abilities (high, medium, and low) and aged 12 to 14 years at Time 1. Qualitative content analysis was conducted to systematically code and identify themes or patterns from the transcribed data. The results revealed that the parents reported few risky online behaviors at both time points; however, the behavior of one adolescent changed between the two time points. Under the PTD model, the adolescents exhibited positive individual assets such as competence, confidence, caring, connection, and contribution at both time points; however, from Time 1 to Time 2, their assets changed from competence and caring to confidence and contribution. The parents were more concerned about the negative influence of technology on their children at Time 2 than at Time 1. From Time 1 to Time 2, the parents' parenting styles changed between permissive and authoritarian styles depending on their children's risky online behaviors. The implications of our findings for researchers, teachers, and parents are discussed.

**Keywords:** Longitudinal Changes, Parents, Early Adolescents, Risky Online Behaviors, Positive Technological Development.

## 1 Introduction

The use of digital technologies is prevalent among adolescents. Because adolescents have more opportunities to use these technologies, they are also at higher risk of engaging in risky online behaviors, including cyberbullying, watching pornography, and privacy breaches (DeMarco et al., 2017; McHugh et al., 2018). Researchers have highlighted the effects of technology on the development of adolescents when they

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transition from childhood to adulthood and experience growth in various aspects (Fitton et al., 2013; Shah et al., 2019). Family relationships, especially parent–child relationships, are crucial during adolescence because parents substantially influence their children’s online behaviors through active mediation of the relevant online activities (Dworkin et al., 2019; Soh et al., 2018). Although parental involvement is essential, it can have adverse effects on adolescents if it is not implemented appropriately. For example, a controlling parenting style tends to increase the risk of adolescents engaging in cyberbullying victimization and perpetration (Katz et al., 2019). Therefore, adopting an appropriate parenting style is crucial for reducing the risky online behaviors of adolescents. Some adolescents may conceal their participation in such behaviors from their parents, and parents may have limited knowledge of these behaviors (Dolev-Cohen & Ricon, 2020). Thus, parents should encourage their children to openly discuss topics related to online risks and raise their awareness about these risks.

Given the key influence of parenting on the online behaviors of children, parents’ views on the risky online behaviors of adolescents must be clarified, and parents must be guided to teach their children regarding the proper use of technology. To this end, the theoretical model of positive technological development (PTD) was developed on the basis of the positive youth development (PYD) framework; the model explains youth development and positive technology use from multiple perspectives (Bers, 2007, 2012). Although several qualitative studies have focused on parental mediation strategies for technology use by adolescents (Symons et al., 2017), few qualitative studies have explored longitudinal changes of parents’ views on risky online behaviors and PTD of early adolescents. The present study explored longitudinal changes of parents’ views on risky online behaviors and PTD of early adolescents in Hong Kong.

## **2 Literature Review**

### **2.1 Risky Online Behaviors of Adolescents**

Risky online behaviors refer to actions that put an individual at risk online (Khan et al., 2022). Studies have indicated that adolescents engage in various risky online behaviors (Lau et al., 2021; Lau et al., 2022; Lau & Yuen, 2013, 2014). Wisniewski et al. (2017) reported that these behaviors include exposure to sexually explicit content, sexual harassment, and sexual solicitation. Wright (2017) also stated that adolescents engage in cyberbullying, which is a form of cyberharassment that involves repeated attempts to bully and harm others through technological means, thereby increasing their potential risks in an online environment. In the past 10 years, the prevalence of Internet addiction has increased among adolescents because of their higher utilization of the Internet (Chung et al., 2019).

## 2.2 Influence of Parenting Styles on Risky Online Behaviors of Adolescents

Parenting styles can be broadly classified into authoritarian, authoritative, permissive, and neglectful styles (Baumrind, 1971; Maccoby & Martin, 1983). Authoritarian parents strictly manage their children's attitudes and behaviors and provide them with limited affection and support. Authoritative parents are reasonable and unwavering but are also attentive to their children's needs. Permissive parents exercise minimal supervision over their children, and they also allow them to behave as they wish. Neglectful parents are uninvolved in their children's lives. Katz et al. (2019) indicated that the controlling parenting style was positively associated with adolescent engagement in cyberbullying in both the roles of the victim and perpetrator. Moreno-Ruiz et al. (2019) analyzed the relationship between parenting styles and cyberaggression among adolescents. Their study revealed that the authoritarian and neglectful parenting styles were risk factors for cyberaggression. Vale et al. (2018) reported that the permissive and laissez-faire parenting styles were positively associated with adolescent cyberaggression, and that the authoritative and authoritarian parenting styles were negatively associated with adolescent cyberaggression.

## 2.3 PTD

The PTD model extends the PYD framework into the technology domain; it aims to help children to apply their technological knowledge and skills to improve themselves and the society (Bers, 2012). The PTD model can be considered as a theoretical framework or a development trajectory (Bers, 2007). As a theoretical framework, it draws on Papert's constructionism concept by focusing on the role of computers in education and the design of learning tools. As a development trajectory, it achieves PTD through mutual interactions among individual assets (competence, confidence, caring, connection, character, and contribution), technology-mediated behaviors or activities (content creation, creativity, conduct, communication, collaboration, and community building), and applied practice. In particular, this study focused on the six individual assets that early adolescents may develop when they start secondary school.

According to Bers (2012), competence refers to an individual's ability to employ technology to execute projects for accomplishing goals and solving problems. Confidence refers to an individual's belief in his or her ability to complete tasks successfully in a technologically advanced world, seek assistance when required, and display persistence when faced with technical challenges. Caring refers to an individual's readiness to address others' needs, help others with technology-related issues, and utilize technology to benefit others. Connection refers to the positive ties created and sustained through technology. Character refers to a sense of morality that ensures safe, ethical technology use and the ability to communicate one's beliefs through technology. Contribution refers to the attitude of introducing and using technology to address social issues. Lau et al. (2022) found that Hong Kong early adolescents exhibited clear signs of PTD; specifically, they exhibited high self-efficacy in using technology, contributed to society through technology, and used technology to maintain their relationships with their family members, peers, and teachers.

## 2.4 Influence of Parenting Styles on PYD/PTD of Adolescents

Studies have also examined the effects of parenting styles on the PYD of adolescents. Leung and Shek (2018) found that maternal responsiveness and demandingness positively predicted the positive development of adolescents in poor Chinese single-mother families, and these associations were mediated by the filial piety of adolescents. Kiadarbandsari et al. (2016) revealed that the effects of the authoritative and uninvolved parenting styles on the PYD of adolescents were significantly positive and negative, respectively. Bowers et al. (2014) reported that the authoritative and highly involved parenting styles were positively associated with the PYD of adolescents. Lau et al. (2022) indicated that when parents controlled their adolescent children's online activities, their children were reluctant to disclose the Internet content to their parents. When parents granted their children unrestricted access to the Internet, their children either overused it or controlled its use themselves. Parents should thus adopt an appropriate parenting style in relation to their adolescent children's online behaviors to facilitate their PTD.

Studies have investigated the risky online behaviors and PYD/PTD of adolescents and the influence of parenting styles on their risky online behaviors and PYD/PTD by conducting cross-sectional self-reported surveys or semi-structured interviews of either adolescents or their parents. However, few studies have examined whether and how the risky online behaviors and PTD of adolescents, their relationships, and the effects of parenting styles change over time, especially from the parents' perspective. Thus, the following research questions were investigated in the present study:

1. What risky online behaviors do early adolescents exhibit and do these behaviors change over time?
2. How do early adolescents positively use technology and does their positive technology use change over time?
3. What is the relationship between risky online behaviors and PTD in early adolescents and does this relationship change over time?
4. How do parenting styles affect the Internet use of early adolescents and do parenting styles change over time?

## 3 Method

### 3.1 Participants

Parents from five families with children from five secondary schools in Hong Kong were invited to participate in semi-structured interviews conducted through Zoom at Time 1 (June 2021) and Time 2 (June 2022). The children of the parents were all male with different academic abilities (high, medium, and low) and aged between 12 and 14 years at Time 1. Informed consent was sought from the children's schools and their parents before the interviews. For the first family (Family 1), both the mother and father were interviewed at Time 1, but only the father was interviewed at Time 2. For the second to fourth families (Families 2 to 4), both the mother and father participated in

the interviews at Time 1 and Time 2. For the fifth family (Family 5), only the mother was interviewed at Time 1 and Time 2.

### **3.2 Data Collection**

In the present study, data were collected from parents by using semi-structured interviews (Adeoye-Olatunde & Olenik, 2021). Semi-structured interviews were conducted using a guide to facilitate the flow of conversation. Each interview comprised two parts. In the first part, the parents were asked to provide demographic information and describe the Internet use of their children. In the second part, the parents expressed their views about their children's risky online behaviors and PTD as well as their relationship and their parenting styles regarding their children's Internet use. All the interview questions, which were mainly open-ended questions, were designed to address the research questions of the present study; whenever necessary, follow-up probing questions were asked to obtain further details. During the interviews, the researchers conversed naturally with the parents while following the interview guide; they also maintained flexibility in their questioning method. After each interview, a research assistant transcribed the audio recording of the interview to produce data for analysis.

### **3.3 Data Analysis**

In the present study, qualitative content analysis was conducted to systematically code the interview data and identify relevant themes or patterns from the transcribed data. The research steps comprised (1) identifying the research questions, (2) selecting the relevant data, (3) creating a coding frame, (4) assigning the selected data to coding units, (5) testing the coding frame, (6) reviewing and revising the coding frame, (7) performing analysis, and (8) interpreting and reporting the findings (Schreier, 2012). Conventional content analysis was conducted to examine the responses to the first and third research questions through inductive coding without imposing predetermined categories (Hsieh & Shannon, 2005). For addressing the second and fourth research questions, directed content analysis was conducted to examine the responses to these questions; notably, the PTD model (Bers, 2007, 2012) and the parenting styles typology (Baumrind, 1971; Maccoby & Martin, 1983) provided the frameworks for deductive coding respectively.

## **4 Results**

An analysis of the interview data revealed broad themes and a primary category for each research question at each time point. The following subsections provide a discussion of the identified categories and direct quotes from the parents' transcripts to illustrate how parents' views changed from Time 1 to Time 2.

#### 4.1 Few Risky Online Behaviors Reported at Both Time Points; Behaviors of One Adolescent Changed over Time

At Time 1 and Time 2, adolescents in most families did not exhibit any risky online behaviors; however, an adolescent from Family 2 exhibited risky online behaviors at both time points. Notably, his behaviors changed over time. At Time 1, he was cyberbullied and browsed adult content. At Time 2, he was involved in an incident about the unauthorized acquisition of a school password.

*“For example, when he first started using WhatsApp, some of his classmates reported that he was cyberbullied, but only to a minor extent. This is the first point. The second point is that sometimes, we see him watching adult content.”* (Father, Family 2, Time 1)

*“He once tried to help his classmates to acquire a school password without authorization.”* (Father, Family 2, Time 2)

When the researchers asked the parents about their children’s risky online behaviors, the parents from two families indicated that they did not observe any such behaviors. However, when the researchers asked the parents about the negative influence of technology, several parents stated that their children were addicted to technology. These findings suggest that some of the parents were unsure about the definition of risky online behaviors.

*“Yes, he is addicted to it. He uses his iPad to chat with his friends after school... I think he is too dependent on the iPad for communication, it is not good.”* (Father, Family 2, Time 1)

*“He is always using his phone, and he is still like that now. He also plays mobile games a lot.”* (Mother, Family 3, Time 2)

#### 4.2 Positive Individual Assets Changed from Competence and Caring to Confidence and Contribution from Time 1 to Time 2

At Time 1, the parents shared how their sons were competent at using technology for learning despite the effects of the pandemic. The mother from Family 2 stated that her son could use an iPad to discuss and learn with his classmates. The mother from Family 4 stated that her son formed a virtual study group with his schoolmates during the pandemic.

*“He may spontaneously use the iPad for reading. He uses this device to communicate with his classmates through Zoom. He engages in group discussions involving four to five classmates, during which they learn from each other.”* (Mother, Family 2, Time 1)

*“He participates in a study group with his schoolmates on Google Meet. They started the virtual study group potentially because they could not meet each other face to face during the pandemic period.”* (Mother, Family 4, Time 1)

Furthermore, at Time 1, the mothers from Family 2 and Family 4 provided examples of how their children used technology to express care and concern for their peers and teachers:

*“About the third point, I believe that he has been using the Internet to show care toward his classmates.”* (Mother, Family 2, Time 1)

*“For example, he made a short video for his teacher. Because he graduated without attending a graduation ceremony, he consolidated memories from his primary school years to make a video as a gift for his teacher.”* (Mother, Family 4, Time 1)

However, at Time 2, the father from Family 4 asserted that his son was confident in using technology. The father from Family 2 recalled one instance when his son made a video, uploaded it, and received numerous views for the video online; that is, his son contributed to society through technology:

*“Yes, for the first point, he is confident in using technology.”* (Father, Family 4, Time 2)

*“The video that he uploaded to the Internet attracted approximately 100,000 views; it was a part of a school project.”* (Father, Family 2, Time 2)

Although no substantial change to the connection asset over time was reported, the adolescents used technology to connect with their relatives, friends, and family members at both time points as reported by the father from Family 1 and the mother from Family 5.

#### **4.3 Greater Negative Influence of Technology on Adolescents at Time 2 than at Time 1**

At Time 1 and Time 2, the parents expressed diverse views about risky online behaviors and PTD among their children and the relationships between these factors. The father from Family 2 indicated that the positive and negative influences of technology were generally balanced at Time 1; however, he reported that the influence of technology was more negative than positive at Time 2. The mother from Family 4 reported that she did not observe any negative influences at Time 1. By contrast, the father from Family 4 believed that the influence of technology was more negative than positive at Time 2.

*“I think that the effects of technology are equally positive and negative after I have considered the two sides.”* (Father, Family 2, Time 1)

*“As far as we could observe, no negative effects were present. He could appropriately control his computer use.”* (Mother, Family 4, Time 1)

*“They (the effects of technology) are more negative than positive.”* (Father, Family 2, Time 2)

*“I observed negative effects. For example, I think that he wasted his time playing irrelevant games and watching irrelevant and sensationalist news, short films, and YouTube videos. I think these are negative effects.”* (Father, Family 4, Time 2)

#### **4.4 Changing between Permissive and Authoritarian Parenting Styles from Time 1 to Time 2**

The parents from Family 2 and Family 3 adopted a permissive parenting style at Time 1. They respected their children and trusted them to act responsibly online. However, at Time 2, the parents reported that their children spent excessive amounts of time using technology; thus, they switched to an authoritarian parenting style:

*“For me, I would say that I am adopting a permissive style. Unfortunately, he cannot control himself well, so I would try to intervene.”* (Father, Family 2, Time 1)

*“I think I am adopting a permissive style. Yes, we have been quite lenient with him. He can control himself.”* (Mother, Family 3, Time 1)

*“We limit his technology use. I think that whenever he was not studying, he would play for more than 2 hours.”* (Mother, Family 2, Time 2)

*“If he plays too much, I will tell him to stop playing so much.”* (Father, Family 3, Time 2)

The mother from Family 5 adopted an authoritarian parenting style at Time 1. To limit her son’s technology use, she created a recreational schedule for her son to follow during the school holidays or on the days when he was not required to attend school. However, at Time 2, the mother stated that her son became rebellious when she attempted to strictly control her son’s technology use. Consequently, the mother switched to a permissive parenting style:

*“At home, we usually created a schedule for him. On holidays or days on which he was not required to attend school, we would allow him to have 2 to 3 hours of recreational time, during which he could play games on his smartphone or engage in other recreational activities.”* (Mother, Family 5, Time 1)

*“He is not the same as he was during his primary school years. We are now less strict because he would, otherwise, become more rebellious. I told him to manage his time reasonably. When I told him not to do something, he became stubborn and chose to go ahead and do it.”* (Mother, Family 5, Time 2)

## **5 Discussion and Implications**

The results indicated that the risky online behaviors of early adolescents were limited at both time points; such behaviors, including watching online pornography, online privacy breaches, and Internet addiction, were also reported in other studies (Chung et al., 2019; Wisniewski et al., 2017; Wright, 2017). Notably, the behaviors of one adolescent changed over time. Consistent with the findings of Sun et al. (2022), the risky online behaviors of the adolescents examined in the present study were mild. The adolescents in the present study exhibited individual assets such as competence, confidence, caring, connection, and contribution at both time points acquired through education or self-learning (Bers, 2007, 2012). However, from Time 1 to Time 2, the assets that they exhibited changed from competence and caring to confidence and contribution. At Time 1, the emergence of the COVID-19 pandemic considerably influenced the lives of the adolescents, including their learning; due to the pandemic, they were required to engage in online learning only. The adolescents had numerous opportunities to learn how to use various technologies, and this experience enhanced their technological competence. Furthermore, they could only use technology to express their care and concern for their peers. At Time 2 (i.e., 1 year after Time 1), the adolescents became more confident in using technology and could use technology to make contributions when they returned to their schools to engage in face-to-face learning and communication with their peers.



Regarding the impact of technology on the adolescents, the views of their parents changed over time, indicating the presence of multiple relationships between the risky online behaviors and PTSD of the adolescents. Although an inverse relationship is typically observed between the risky online behaviors and PTSD of adolescents, Lau et al. (2022) highlighted that factors such as personal interests and peer influence can obscure this relationship. In the present study, the parents believed that the effects of technology on their children were more negative than positive at Time 2 relative to Time 1; some of the parents also appeared to be more worried about their children's use of technology at Time 2. Sorbring (2014) found that parents were worried and concerned about their teenage children's negative Internet experiences, and that the extent of their concerns varied on the basis of various demographic variables of their children. The most worried parents were those with an accurate understanding of their children's negative Internet experiences. This explains why some of the parents in the present study were more concerned about the negative influence of technology on their children at Time 2 than at Time 1 because they knew more about their children's risky online behaviors as time passed. By contrast, other parents were ambivalent about their children's Internet use.

In the present study, the parents adopted parenting styles such as permissive and authoritarian styles at both time points; however, they also switched between these two styles from Time 1 to Time 2 according to their children's risky online behaviors. These results align with the findings of other studies, which have reported the permissive and authoritarian parenting styles as risk factors for the Internet misbehaviors of adolescents (Moreno-Ruiz et al., 2019; Vale et al., 2018). Although the parents observed the positive influence of technology on their children (Lau et al., 2022), they still changed their parenting styles when they observed the negative influence of technology on their children. The parents focused on the potential risks associated with the improper use of technology by their children. Over time, the parents increasingly recognized that their children had grown up, and that they had to adjust their parenting styles accordingly. They were concerned that continuing with their original parenting styles would cause their children to become disobedient. This finding suggests that parenting styles can change in response to juvenile delinquency (Schroeder & Mowen, 2014).

The findings of the present study enrich our understanding of longitudinal changes of parents' views on the risky online behaviors and PTSD of early adolescents in Hong Kong. Specifically, the present study provides qualitative evidence of the changes in the risky online behaviors and PTSD of adolescents, the relationships between their risky online behaviors and PTSD, and the parenting styles adopted to manage the Internet use of these adolescents; notably, in the present study, the data used were collected over a 1-year period and pertained to the perspective of parents. The present study revealed that the risky online behaviors of the adolescents were mild; however, their parents generally believed that the effects of technology use on their children were more negative than positive, and they were also unclear regarding the definition of risky online behaviors. Therefore, teachers should work closely with parents to help them identify online risks that may negatively affect their children's well-being, and the PTSD of adolescents should be promoted through effective parenting. Teachers should also

educate their students about how they can positively use technology and how they can develop a healthy relationship with their parents at home in relation to technology use.

## 6 Conclusions

The present study examined longitudinal changes in parents' views on the risky online behaviors and PTD of Hong Kong early adolescents. From Time 1 to Time 2, the early adolescents rarely engaged in risky online behaviors. The individual assets that they exhibited changed from competence and caring to confidence and contribution. The parents perceived that the influence of technology use on their children was more negative than positive. These parents changed their parenting styles in response to their children's risky online behaviors. Notably, the present study has several limitations that should be addressed in future studies. The children of the parents interviewed in the present study were all male. Thus, future studies should include female early adolescents in their sample to identify gender differences in risky online behaviors and PTD. Only the fathers and mothers from three families were interviewed at both time points; therefore, the consistency of the parents' views regarding their children's technology use was difficult to verify. Future studies should interview both the father and mother of each participating family. The present study did not compare the views of parents with those of their children. Such comparison should be conducted in future studies to obtain further insights into the risky online behaviors and PTD of early adolescents.

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