

# Grand Challenges of Researching Adolescent Online Safety: A Family Systems Approach

**Pamela Wisniewski**

The Pennsylvania State University  
[pamwis@ist.psu.edu](mailto:pamwis@ist.psu.edu)

**John M. Carroll**

The Pennsylvania State University  
[jcarroll@ist.psu.edu](mailto:jcarroll@ist.psu.edu)

**Heng Xu**

The Pennsylvania State University  
[hxu@ist.psu.edu](mailto:hxu@ist.psu.edu)

**Mary Beth Rosson**

The Pennsylvania State University  
[mrosson@ist.psu.edu](mailto:mrosson@ist.psu.edu)

## ABSTRACT

Protecting adolescents from online safety risks is a major contemporary concern, and researching adolescent online safety is equally as challenging. Relatively few researchers have studied adolescent online safety, but the studies that do exist have documented threats from privacy breaches, cyberbullying, sexual predation, and other types of risk exposure. The grand challenge, however, is how we can approach these problems in a way that will protect adolescents while allowing them to engage socially online. We discuss two key challenges: operationalizing online safety; and defining online risks. We propose that Information Systems (IS) researchers should leverage family systems theory, a methodological approach grounded in developmental psychology, in order to address adolescent online safety issues.

## Keywords (Required)

Adolescents, Online Safety, Privacy, Parents, Family Systems

## INTRODUCTION

Adolescence has always been considered an awkward stage of life. Empirical evidence points to adolescence as a time of life marked by change and rapid development. Sociologists have long noted that starting the age of 13, adolescents demonstrate pseudo-maturity by attempting to handle issues independently (even beyond their developmental capability), taking emotional risks, or distancing themselves from their parents (Lerner 2002). While adolescents are no longer children, they are not yet adults. Adolescents are by nature sensation-seeking and more likely to take greater risks than children and adults (Lerner 2002). Adolescents also intensely focus on social life during this time, and consequently have been eager and early adopters of the Internet and social networking applications that help them engage with their peers (ISTTF 2008). Even though adolescents are among the most frequent adopters of Internet technologies, current laws designed to protect children from online risks fail to address the challenges faced by this cohort. For instance, teens age 13-17 with online profiles are more likely than children age 10-12 to share personal information (Lenhart et al. 2007). Yet, the U.S. Congress enacted the Children's Online Privacy Protection Act (COPPA) to prevent website operators and marketers from collecting data from children younger than age 13 years without the express consent of parents. The privacy of teens age 13 years and older is not protected by the COPPA law. Therefore, adolescents above 13 years of age are treated the same as adults, making this population even more vulnerable to dangerous online privacy breaches and safety hazards. As adolescents (age 13 years and older) demonstrate increased independence and higher risk-taking characteristics, protecting their online safety remains a critical challenge.

The objective of this work is to systematically outline some of the acute challenges that face researchers as we strive to understand and improve information privacy and online safety for adolescents. We also advocate moving toward a family systems approach when trying to understand and develop strategies to address adolescent online safety outcomes. Family systems theory applies a systems approach which acknowledges the bidirectional influences of parents on adolescents and also of adolescents on parents (Schermerhorn et al. 2008). It is only within this family system that the full nature of this problem can be contextualized and solutions derived. We are targeting this paper to Information Systems (IS) researchers who are familiar with both systems thinking and the perils of online interaction but have devoted limited efforts on one significantly overlooked unit of analysis: *the family*.

## BACKGROUND

For the most part, IS research has historically focused on the information technology outcomes in an organizational setting. However, since the explosion of personal technology use in the 1990's, the IS research community has expanded to incorporate studies on the technology usage at both individual and group levels. We performed a search of the AIS Digital Library for research related to adolescents and technology and scanned titles, abstracts, and papers to understand broad themes. We made four important observations: First, IS research topics involving adolescents approximated a distinct technology maturity curve that started in the early 2000's with studies on various types of technology adoption, continued between 2005 and 2006 with post-adoption studies of various intention and behaviors, then quickly spiraled between 2007 through 2012 to technology abuse and dangers. Between 2007 and 2012, studies include social consequences of cell phone use (Vaidyanathan et al. 2007), problematic technology usage (Jia et al. 2007), game addiction (Sepehr et al. 2012; Xu et al. 2008b; Zhan et al. 2012), information privacy and disclosure (De Souza et al. 2008; Koroleva et al. 2011b; Xu et al. 2008a), music piracy (Nandedkar et al. 2009), text message dependency (Barto et al. 2010), internet grooming, sexual abuse, online sex offenders, and online predatory coercion (Albert et al. 2011; Albert et al. 2012; Eneman et al. 2010). Second, there are relatively few studies specifically targeting adolescent populations. Like most academic research, even when topics are acutely relevant to adolescents, such as cyberbullying (Zhang et al. 2010), studies tend to focus on college students instead of teens. Of the studies cited above, we found only three (De Souza et al. 2008; Koroleva et al. 2011b; Vaidyanathan et al. 2007) that recruited adolescent participants. Third, IS research tends to frame the protection of adolescents from online threats as a matter either of parental behavioral control or as restriction of adolescent information disclosures. However, developmental psychology suggests that such a lens may be short-sighted. Autonomy from parents and experiential learning through risk-taking behaviors are, to some extent, normal and necessary for adolescent developmental growth (Baumrind 1987). Fourth, while IS research tends to be strong when it comes to understanding factors that contribute to negative outcomes and developing conceptual models to understand relationships between salient constructs, very few if any IS studies have sought to identify and empirically validate effective interventions for promoting adolescent online safety. To encourage action-based IS research for adolescent online safety, we discuss two conceptual challenges that the research community must address; we conclude by proposing a family systems approach to addressing adolescent online safety.

## GRAND CHALLENGES

### Operationalizing Online Safety

The end goal of our research is to protect adolescents from information breaches and harmful interactions online while still allowing them to engage in beneficial online activities. However, researchers are still searching for dependent variables that can indicate progress toward this goal. Conceptually, what is online safety? Is safety the absence of risk and harm; strategies to avoid risk and harm; or a sense of coherence and resilience in the face of risk and harm (Antonovsky 1987)? Studies have approached the problem of online safety from the perspectives of privacy boundary regulation and parental control. For instance, through interview studies, Yardi (2012) aimed to understand parental control and youth's social media use. Similarly, Erickson et al. (2013), explored parental boundary setting of adolescent technology use. Other researchers have operationalized dependent variables for online safety as intention toward protective behaviors (Crossler et al. 2008a), intent to disclose information (De Souza et al. 2008; Lwin et al. 2008), and exposure to risk (Leung et al. 2012).

Online safety is an intangible concept and each of its constituent constructs is of interest to this community; however, focusing solely on information privacy may reinforce flawed assumptions. For instance, researchers tend to assume that privacy and online safety go hand-in-hand, but the two have often been operationalized in very different ways. Privacy has often been understood in research as a form of individual information ownership (Westin 1967), conceptualized as the individual trust toward organizational privacy practices (Xu et al. 2005), or operationalized as the individual ability to control information disclosure (Zweig et al. 2002). While information privacy is an important aspect of online safety, it is not a sufficient definition. An adolescent cannot protect him or herself from online dangers, such as sexual predators and cyberbullies, simply by withholding personal information. Yet, the majority of IS privacy research regarding adolescents continues to focus on information privacy and personal disclosures (De Souza et al. 2008; Koroleva et al. 2011a; Xu et al. 2008a).

Alternatively, focusing on parental control as a means to promote online safety may imply that if adolescents obey their parents, they will remain safe. Unfortunately, empirical evidence suggests that adults fall victim to many of the same online risks as their adolescents. In addition, all parents do not parent in the same manner. Some parents are neglectful or indulgent toward their children (Baumrind 2005; Steinberg et al. 1992), ultimately leaving tough choices up to the adolescent. Further, risk exposure may not always result in harm. For example, two adolescents may view the same pornographic image. One may be unbothered by the image and move on with his or her life; the other may be emotionally distressed by the image or

use it as a first step toward a more serious porn addiction. Harm from exposure is contingent on the individual characteristics of the adolescent, such as existing psychological problems, level of resilience (Livingstone et al. 2011), or moral character. In summary, while there obviously is no perfect measure of online safety, researchers must be cognizant of the assumptions they are making when trying to operationalize the concept. We also must be willing to discuss the limitations and philosophical implications of our assumptions.



**Figure 1: Process Model of Online Safety/Risk**

In Figure 1, we present a preliminary conceptual model that frames adolescent online safety as a transactional process rather than a simple construct. This model is based on work by Livingstone et al. (2013), with expansions motivated by our own observations. Some researchers have targeted online safety from the perspective of reducing risky behaviors (Lwin et al. 2008) or increasing the intention toward protective behaviors (Crossler et al. 2008a). These researchers subscribe to a behavioral view of online safety, assuming that adolescents can achieve their own online safety by performing or not performing certain behaviors. A limitation of this assumption is that adolescents can be both passive victims and active perpetrators of harmful online interactions. Sometimes, adolescents are exposed to pornography, harassment, and other online risks that arise due to absolutely no fault of their own. Other researchers have approached online safety from the perspective of trying to limit risk exposure, thereby trying to reduce risk events (Albert et al. 2011; Leung et al. 2012; Livingstone et al. 2011; Yardi 2012). This research tends to focus on reducing various types of technology addiction, restricting usage (Leung et al. 2012), or increasing parental control. Here, the underlying assumption is that restriction can reduce risks without negatively impacting the positive outcomes of online activities. From a developmental perspective, adolescents should be exposed to some level of risk so that they can learn and mature from their experiences. Therefore, removing too much exposure to risk could developmentally stunt an adolescent (Baumrind 1987).

Very little research has focused on how adolescents actually respond once they have experienced a risk event (D'Haenens et al. 2013). A risk response perspective assumes that adolescents are engaged participants in their own online safety management process. D'Haenens et al. found that adolescents who took active measures to protect themselves, such as blocking a person or deleting a message, or who talked to someone else about negative online experiences, tended to respond more positively to a negative experience than those who took a fatalistic approach, hoping the problem would go away on its own (D'Haenens et al. 2013). This leads us to the final stage in our proposed process model: the risk result. A risk result represents the true consequences of a risk event experienced by the adolescent. Negative results may include low self-esteem, decreased sense of well-being, and other psycho-social types of harm. The risk result perspective assumes that the impact of online risk is individualized for each adolescent. Very few researchers have even attempted to measure the consequences of online risk events and whether or not they actually resulted in harm. Researchers from EU Kids Online (Livingstone et al. 2013) were one of the first to make the distinction that risk exposure does not necessarily result in harm. They measured harm by asking children whether or not they were bothered by a various types of risk exposures (D'Haenens et al. 2013; Livingstone et al. 2011). However, we must be careful not to dichotomize an adolescent's ultimate reaction to risk events as a

binary of online safety or harm. Online experiences are complex, evoking a wide array of psycho-social and emotional responses, both negative and positive, and that can happen instantaneously or over an extended period of time. Therefore, measuring the true consequences of adolescent negative online experiences is another grand challenge.

### Defining Online Risks

As shown in our model in Figure 1, one inherent assumption of promoting adolescent online safety is that there are implied online risks. Thus far, we have discussed online risks in the general sense as “risk events” and, in some instances, listed examples of different types of online risks. Similarly, researchers often do not take the time to systematically identify and define online risks. Instead, they tend to take one of two approaches: The first approach is to provide general examples of online risk, such as pornography or sexual predation, as a way to motivate the research objectives (Valcke et al. 2010; Wirth et al. ; Yardi 2012). This is a common approach because it is a generally accepted belief that adolescents are at risk online, and we need to do something to protect them from the negative consequences of these risks. However, one limitation of generalizing online risks in this way is that the risk that motivates the research is often not directly tied back to the research goals. If we are to reach our goal of protecting adolescents from online safety risks, we need to clarify from what we are protecting them. To illustrate, Valcke et al. motivated their work by identifying cyber-bullying, cyber-stalking, online threats, internet addiction, and commercial exploitation, unintentional information sharing, and more as potential adolescent online risks (2010). They used this list of risks to motivate their study, which surveyed parents about parenting style and child Internet usage. Their results suggested that parenting style, parent internet behavior, and parent education level were significant predictors of child Internet use. However, while other studies have found a positive relationship between Internet usage and risk exposure (Leung et al. 2012), this particular study did not tie restricting child Internet use back to reducing any of the actual risks that motivated their work. When researchers do link research goals to online risks, they tend to take a second approach, which is to study a particular risk in isolation. For instance, cyberbullying and information privacy breaches are usually treated as two separate research streams (De Souza et al. 2008; Koroleva et al. 2011a; Zhang et al. 2010). Granted, the antecedents and consequences of risk events can be similar or extremely different, depending on the type of risk and the adolescent. However, the underlying process and mechanisms that emerge from these phenomena may exhibit overlap and provide useful insights and opportunities for shared methodological approaches if they were merged.

Some research has leveraged a multi-dimensional approach to online risks. For instance, Leung et al. operationalized three types of risk exposure: Internet harassment, privacy risk, and harmful influences or exposures. They found that older male adolescents tended to experience more harassment and exposure to violence and pornography while older female adolescents experienced more privacy risks (Leung et al. 2012). Researchers have not agreed, however, on how to classify adolescent online risks. The most comprehensive, yet highly conceptual, classification of risks relating to Internet classifies risks into content, contact, and conduct related risks (Livingstone et al. 2011). For example, pornography and violent content are considered content-related risks; contact-related risks include harassment and sexual predation; and conduct-related risks include cyberbullying and sexting. This multi-dimensional abstraction of Internet risks is more theoretically nuanced than the taxonomy of online risks we present in Figure 2, but we feel that our classification is an equally complete and more tangible way to frame adolescent online risk categories. We base this taxonomy on a grounded approach of reviewing related literature, then classifying the specific examples of online risks into composite categories. We believe that it would be a formidable challenge to incorporate all of these online risk types into one research stream. Therefore, we identify this as one of our grand challenges.

Harassment	Solicitation	Exposure	Informational	Ethical
<ul style="list-style-type: none"> <li>•Cyberbullying</li> <li>•Threats, Intimidation</li> <li>•Ridicule, hate speech</li> <li>•Anti-social behavior</li> </ul>	<ul style="list-style-type: none"> <li>•Sexual, predatory</li> <li>•Stranger contact</li> <li>•Commercial</li> </ul>	<ul style="list-style-type: none"> <li>•Pornography</li> <li>•Violence</li> <li>•Explicit, inappropriate</li> <li>•User-generated content</li> </ul>	<ul style="list-style-type: none"> <li>•Identity management</li> <li>•Breach of private information</li> <li>•Loss of intellectual property</li> <li>•Over sharing</li> </ul>	<ul style="list-style-type: none"> <li>•Illegal downloading</li> <li>•Plagiarism</li> <li>•Problematic use, addiction</li> <li>•Harm to others</li> </ul>

**Figure 2: Online Risk Event Categories**

### TAKING A FAMILY SYSTEMS APPROACH

In a study of adolescent girls, Berson and Berson (2005) found that dialogue with and monitoring by significant adults positively influenced young people's online behavior. Their results suggested that youth are less likely to engage in risky online activities such as disclosing private information, having face-to-face and virtual meetings with strangers, sharing photos and threatening message exposure when significant adults practice direct supervision, periodic monitoring and ongoing discussions. Clearly, parents are key actors in the negotiation and management of adolescent online interactions. Given results such as this, we advocate changing the level of analysis from the individual to the family unit. Adolescent online safety can be viewed as a function of both parenting and the individual characteristics of the adolescent. There is no one-size-fits-all formula to parent adolescents in order to keep them safe online. Some adolescents have higher levels of psycho-maturity and more advanced boundary development, allowing them to navigate online dangers with very little help from their parents. Other parents may need to exert more authoritarian or authoritative control over their children in order to keep them out of harm's way. One premise of family systems theory is a focus on underlying transactional processes that involve trying to untangle the complex influences from parent to child, from child to parent, and can even include influences between siblings. Better understanding of the nature of these multiple influences and processes can provide valuable insights for designing impactful interventions (Cummings et al. 2012). To date, we have not found any research on adolescent online safety that uses a family systems approach. Family systems research is comprised of an emerging set of methods for studying families as a system; three main tenets of family systems theory include: 1) a focus on transactional and bidirectional processes, 2) longitudinal effects, and 3) multi-level analysis (Cummings et al. 2012). We will illustrate how current adolescent online safety research departs from family systems methodologies and show how implementing these methodologies may be able to strengthen this research domain.

Most studies of adolescent online safety are cross sectional and take the individual as the unit of analysis. Researchers have developed quasi-experimental designs to query teens and pre-teens about parenting styles and intent to disclose information (Lwin et al. 2008). Others have performed face-to-face structured interviews with adolescents to understand the relationship between parenting style, information technology literacy, internet addiction, and online risk exposure (Leung et al. 2012). In some cases, parents rather than adolescents have been used to inform studies focused on adolescent outcomes (Crossler et al. ; Eastin et al. 2006; Valcke et al. 2010; Yardi 2012). The overarching theme, however, has been to focus on the individual – either on the adolescent or the parent – as the informant of aspects of adolescent online safety.

The concern with conducting studies on either adolescents or parents is that we are unable to get the full picture. Research has shown that parents and adolescents often have different perceptions on key constructs, such as parenting style and adolescent risk behaviors (Li et al. 2002; Lwin et al. 2008). Very few studies on adolescent online safety have captured perceptions from both adolescents and parents. A recent study interviewed 12 parent-child dyads regarding boundary setting, privacy, and online safety (Erickson et al. 2013). Key emergent themes included the role of technology savviness of parents and adolescents, virtual boundaries in physical spaces, the role of media in online safety awareness, and a sense of loss of control from the parents. A larger study of 25,142 children and at least one parent captured cross-sectional quantitative data (Livingstone et al. 2011). They compared the child's perception of parental mediation strategies with parents' perceptions; the perceptions were highly correlated but also different. In contrast, family psychology research has applied more structured and methodologically robust family systems techniques to understanding family dynamics in a way that can show evidence

of causation, not just correlation and differences. For example, longitudinal parent-child dyadic studies have used multi-level hierarchical linear modeling in order to understand the impact of marital conflict on children (Goeke-Morey et al. 2007) and the impact of parental monitoring strategies on risky sex behaviors concerning HIV (Metzger et al. 2012). Because these studies were both longitudinal and dyadic, the researchers were able to better understand family dynamics and outcomes as they pertained to the family unit. Our current research has had a difficult time doing this. For example, research collected at the individual level with cross-sectional data has suggested that more authoritative and authoritarian parenting is related to higher levels of risk behaviors and risk exposure for older teens (Livingstone et al. 2011; Lwin et al. 2008). This finding could lead us to conclude that teens exhibit a rebellious nature toward their parents as they get older. However, we have to be careful that we do not assume that correlation implies causation. Through longitudinal analysis, we may find that adolescents who have had problems online in the past trigger a reactive parenting response by their parents in the future. Through more multi-level and longitudinal techniques, these types of insights could be possible and greatly contribute to our understanding of family dynamics for adolescent online safety.

## **CONCLUSION**

In this paper, we presented some of the grand research challenges of examining and trying to improve adolescent online privacy and safety outcomes. Admittedly, we do not have complete solutions to these grand challenges, but we attempted to provide some conceptual frameworks and insights to help guide future research. The first challenge is how to operationalize online safety. Unless we have a well-defined end goal, we will not be able to achieve it. We presented a framework for how online safety has been conceptualized in current research as well as the underlying assumptions and limitations of each of these conceptualizations. The next challenge is defining the types of risks from which we are trying to protect adolescents. We identified five high-level categories of online risks that have been highlighted in past research. These included harassment, solicitation, exposure, informational, and ethical risks. Researchers may be able to gain some economies of scale, as well as useful insights, if we can combine these risk types into one research stream. Finally, we advocate that researchers take a family systems approach, contextualizing adolescent online privacy and safety goals to the interactions between the adolescent and his or her family. Future research may also incorporate a larger systems perspective of trying to understand the role of peers, teachers, and other community members in protecting adolescents online.

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