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Family Communication: Examining the Differing Perceptions of Parents and Teens Regarding Online Safety Communication

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FAMILY COMMUNICATION: EXAMINING THE DIFFERING
PERCEPTIONS OF PARENTS AND TEENS REGARDING ONLINE SAFETY
COMMUNICATION

by

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A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Computer Science
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ABSTRACT

The opportunity for online engagement increases possible exposure to potentially risky behaviors for teens, which may have significant negative consequences (Hair et al., 2009). Effective family communication about online safety can help reduce the risky adolescent behavior and limit the consequences after it occurs. This paper contributes a theory of communication factors that positively influence teen and parent perception of communication about online safety and provides design implications based on those findings. Previous work identified gaps in family communication, however, this study seeks to empirically identify factors that would close the communication gap from the perspective of both teens and parents. I analyzed data from a survey of 215 teen-parent pairs with a cross-sectional design and examined the factors that contribute to increased family communication about online safety. For parents, active mediation, technical monitoring of their teens' devices, and a perceived positive affect schedule of the teen were associated with higher levels of family communication. Our results were similar for teens, except that parental monitoring and the teen's online safety concern were also positively associated with increased family communication, while restrictive mediation was associated with lower levels of family communication. A key implication of these findings is that teens do not want to be left alone, but desire active mediation and monitoring. Teens do not want technological based restriction. As the first study to explore specific mechanisms which may improve family communication between parents and teens regarding online safety, I am able to recommend design solutions that allow teens an active role in their own online safety and facilitate effective family communication from the perspectives of both parties by assisting parents to adopt active mediation techniques rather than developing technologies that encourage restrictive parenting. Many designs

for parents and teen monitoring historically support a restrictive approach (P. Wisniewski et al., 2017). Rather than focus on parental control applications, I advance both analytical support for a more nuanced theoretical and practical applications.

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CHAPTER 1: INTRODUCTION

The teenage years represent an important transitional time for parent-child interactions as teens approach adulthood: Teens' attitudes and beliefs mature and they become less dependent on their parents (Arnett, 2012). In general, adolescence is characterized by heightened risk-taking (Steinberg, n.d.) and increased independence (Baumrind, 2005; Youniss & Smollar, n.d.). Online environments magnify teenager's opportunities to engage in risky behavior (P. J. Wisniewski et al., 2014). Adolescents are less capable than adults at managing online risks without guidance (Cohn et al., 1995) and so parents may be concerned about potential online threats or harm teens may experience online (P. J. Wisniewski et al., 2014). Effective communication between parents and teens is an important protective factor for addressing risky adolescent behavior (Aspy et al., 2007; Liu, 2003; Livingstone & Smith, 2014). However, parentally enforced rules about technology use—when teens can use technology, what content they can access, and what controls parents enforce—may create tension in parent-child relationships. In mediating teen's online interactions, parents often experience tension in balancing an adolescents' need for autonomy and seeking to preserve their safety and well-being (Czeskis et al., n.d.; Hartikainen et al., 2016). Teens prefer to experience a relationship of trust and respect for their privacy with their parents, rather technical monitoring that restrict their online activities (Ghosh et al., 2018). Family communication is vital to teen online safety. By discovering patterns in how a) teen positive and negative affect, b) online safety concern, c) teen online risk exposure, and d) parental mediation strategies influence teens and parents' perception of their communication about online safety, this paper contributes to an improved understanding

of teen and parent interactions that support the creation of effective solutions to protect teen safety online in the future. This paper addresses the following research questions:

RQ1: *Is there a difference between how teens and parents view family communication around the teen's online safety?*

RQ2: *What factors contribute to how teens and parents view their family communication around the teen's online safety?*

To address the research questions, I analyzed data from an online survey of 215 adolescents (aged 13-17) and their parents. I performed a paired t-test to determine if there was a difference between how teens and parents rate their communication (RQ1). I developed two linear regression models, one for the teen data and one for the parent data to explore factors contributing to how teens and parents perceive their communication about online safety (RQ2). I applied a block approach to the linear regression models to examine the effects of each variable group on the model. These models evaluated gender, age, income, and risk exposure (Block 1), online safety concern (Block 2), parental mediation strategies (Block 3), and teen's positive and negative affect schedule (PANAS) (Block 4). I chose to control the inclusion of independent variables in the models block by block, in order to obtain coefficients and statistics for specific blocks.

The paired t-tests indicated that teens perceived a significantly higher frequency of family communication than parents reported. These differences were further explored in the regression models to evaluate the factors associated with this significant difference. In the regression models, the only variables significant for both the parents' and the teens' perceptions of family communication was parental mediation and positive affect schedule. Parental mediation is

further understood as active, restrictive, monitoring, or technological monitoring. Active parental mediation of internet use describes activities like discussing internet use with the teen and offering help. The more parents engage in active mediation, the more both teens and parents feel like they communicate about online safety. An example of monitoring would be parents checking teen's messages or friends on social media. Monitoring positively impacts both parent and teen perceptions of family communication but is only statistically significant for teens. Parents believe that using technical monitoring such as parental control software increases family communication. Interestingly, teen perception of restrictive parental approaches significantly lowered teen perceptions of family communication. For both parents and teens, perceptions of the teens' emotions over the last two months also positively impacted their views on family communication and that teens saw a significant rise in communication. Teen perspectives of risk also strongly influences their views of family communication – the more concerned a teen was about risk, the more positively they viewed family communication.

This research reveals interesting differences in how teens and parents rate their communication surrounding online safety and what factors contribute to those differences. This understanding will help inform designers on directions for tools that consider the complex issues of conflicting perceptions between teens and parents. Families could find value in software that makes teen's behavior visible in a way that does not breach the level of trust between family members and encourages active mediation strategies. As teenagers' transition from dependent children to independent adults, they require increasing autonomy and privacy while parents desire to maintain safety for their children. Active mediation that honors both these needs may help improve family communication and keep teens safe. These principles are key to the

successful development of applications supporting teen online safety, moving from parental control apps to creating solutions that empower teens to have an active role in their online safety. Applications should also consider how to position parents in the role of active mediation, rather than restriction and control.

Next, I will present related work concerning family communication, parental mediation, and teen online risk exposure and outcomes as well as related hypotheses. This is followed by the data collection and analysis methods and results in the form of descriptive statistics and linear regression models. I will finish the paper by discussing the importance of these findings to both research and design, presenting conclusions, and offering paths for future research.

CHAPTER 2: BACKGROUND

Adolescent safety, online mediation, privacy, and situational based awareness technologies are of great interest to CSCW communities (Ackerman, 2000; Blackwell et al., 2016; Schoenebeck et al., 2016; P. J. Wisniewski et al., 2014). This section highlights key research on family communication and its influence on teen outcomes, parental communication, mediation, and online risk exposures.

Family Communication, Online Risk Exposure, and Safety Concern

Family communication is a process whereby family members negotiate and define their relationships (MCCOBY, 1983). Positive communication enables better family functioning by helping family members share their evolving needs and preferences (Baer, 1999). The importance of family communication to adolescent development is instrumental in positive outcomes for teens in many different aspects of life, especially risky adolescent behavior.

Constant online activity is commonplace for many adolescents (Livingstone & Smith, 2014) and teen online activities are becoming more and more inaccessible to parental oversight (Livingstone, 2009). Previous research has shown that more Internet use facilitates increased digital literacy and safety skills (Livingstone et al., 2011). According to the EU Kids Online research carried out in 25 European countries, European adolescents 11 to 16 year-olds can perform online safety skills such as blocking messages from people they did not want to contact and find safety advice online. Around half of them could change the privacy settings of their social media accounts, block websites, and judge the quality of a website (Livingstone, 2009). There is a significant discrepancy between parent and adolescent views of adolescent online

safety skills. Hartikainen et al (2017) surveyed 141 children and 163 parents and found that children have a significantly more positive opinion of their safety skills than their parents (Hartikainen et al., 2017). Interestingly, the study also found that children were also significantly more confident that their parents know what they do online compared to their parents were (Hartikainen et al., 2017). Blackwell et al. (2016) found, in contrast, that parents underestimate their teens technological engagement (Blackwell et al., 2016).

Adolescents' skills related to online behavior develop differently (Tuominen, 2013) and their developing moral judgment affects their actions (P. J. Wisniewski et al., 2014). They mature at different rates, are exposed to very different experiences, and respond differently to different parental mediation strategies (P. J. Wisniewski et al., 2014). As adolescents are less capable than adults at managing online risks without guidance (Cohn et al., 1995), it is understandable that adults are concerned — worrying that the things adolescents might be exposed to online may be harmful (P. J. Wisniewski et al., 2014). It should be noted, however, that just because there is a risk that something bad might happen, does not mean it will. According to the previously mentioned EU Kids Online study, most European teens and pre-teens have not been bothered by something experienced on the Internet. For example, seeing sexual images and receiving sexts online is relatively common, but generally not experienced as being very harmful from the teen's point of view. In contrast, being bullied online is quite uncommon but is more likely to upset children, however, there is a discrepancy when it comes to parent and teen perceptions of the frequency of teen online risk experiences (Hartikainen et al., 2017).

Based on these empirical findings, I anticipate that:

H1: *For parents and teens, teen online risk exposure is negatively associated with family communication*

H2: *For parents and teens, online safety concern is positively associated with family communication*

Family Communication and Parental Mediation of Online Safety

Threats adolescents face online are usually divided into content threats (i.e. pornographic or violent material), contact risks (i.e. being cyberbullied or groomed), or conduct threats (i.e. cyberbullying others) (Kirwil, 2009). Information security threats (i.e. malware, phishing, or data theft or loss) can be included in the categorization (Hartikainen et al., 2015). The goal of many parents in family communication regarding online safety and risks is to help maximize online opportunities to minimize the risk of harm that online threat pose. For example, adults fear adolescents might experience psychological harm when encountering inappropriate online content (Boyd & Hargittai, 2013). Parental mediation of adolescent online safety includes protecting children from harm, giving them tools to cope with potentially harmful things they encounter online and ensuring that they are not making bad decisions that might have severe consequences. Parental mediation requires a balance between protecting children and teaching them how to cope with the fact that sometimes engaging online can be detrimental (P. J. Wisniewski et al., 2014). Parents are often encouraged to protect their children, as proactive parents are viewed as “good” parents (Boyd & Hargittai, 2013). Parental mediation of online safety is usually divided into 1) Active mediation of adolescent Internet use. For example, talking to the teens about what they do online, sharing activities and guiding and offering help. 2)

Restrictive mediation of adolescent internet such as making rules about what teens may and may not do online. 3) Parental monitoring of teen internet use, such as checking up on what teens are doing online, checking the messages on teens' instant messaging accounts or their profiles on social media. (Hasebrink et al., 2011). In addition, parental monitoring may include 4) Technical monitoring of teen internet use through technologies that attempt to prevent risk (P. Wisniewski et al., 2015) for example by filtering and restricting unwanted use (Hasebrink et al., 2011).

Parents are the most important mediators of adolescent online safety; however, they may be unaware of children's technology use. They may struggle to set rules and boundaries (Yardi & Bruckman, 2011). Even if the parents want more transparency in their children's use of the Internet and mobile devices, they might also find it difficult to implement transparency due to unfamiliarity with the technology (Yardi & Bruckman, 2011). Reduced digital skills of parents have been linked to restrictive or indulgent approaches, while adults with better digital skills are more likely to monitor and actively mediate children's online activities (P. J. Wisniewski et al., 2014). Restrictive mediation in general reduces children's exposure to online risks, but also to reduce their online opportunities and skills (Duerager & Livingstone, 2012). Monitoring adolescent Internet use is sometimes recommended, but there are some concerns as to whether it is ethically acceptable (Magkos et al., 2014). Active mediation through engaging in communication with adolescents concerning their internet use is encouraged because it is linked to lower risk and harm of children while encouraging more online activities and skills (Duerager & Livingstone, 2012). As previously indicated, teens dislike technologies that restrict or monitor their internet use (Ghosh et al., 2018). Parents with reduced digital skills who are more likely to

adopt restrictive approaches to internet use and are less likely to communicate to their teen concerning internet use (Ghosh et al., 2018).

Based on these empirical findings I anticipate:

H3: *For parents and teens, active mediation is positively associated with family communication*

H4: *For parents and teens, restrictive mediation is negatively associated with family communication*

H5: *For parents and teens, monitoring is positively associated with family communication*

H6: *For parents and teens, technical monitoring is negatively associated with family communication*

Family Communication and Adolescent Mental Health: Positive and Negative Affect

Teen-parent communication profoundly impacts teen mental health. Kernis et al (2008) studied 174 pre-adolescent children to evaluate how self-esteem stability and level related to their perceptions of parent-child communication (Kernis et al., 2008). Children with low or unstable self-esteem frequently reported that the father was critical, psychologically controlling and less likely to show approval or acknowledge children's positive behaviours (Kernis et al., 2008). Also exploring teen mental health, Liu (2003) studied 454 children to determine the association between parental communication and adolescent symptoms and found that a higher level of parental care and a low level of parental indifference were associated with lower depression scores (Liu, 2003). Adolescent perceptions of positive parent communication

regarding themselves, their world, and their future were also negatively associated with depression, while negative communication increased depressive symptoms (Liu, 2003). Bosch et al (2012) studied 275 university students to understand how family communication patterns, identity styles, and positive and negative affect interact with each other (Bosch et al., 2012). The results suggest that identity style may represent one mechanism by which the effects of family communication patterns affect psychosocial outcomes (perceived social support and positive and negative affect) in young adults (Bosch et al., 2012). These studies support the importance of conversation and communication for improved psychosocial outcomes during the transition to adulthood.

Teen mental health is particularly important to understand, as it is also associated directly with negative outcomes for risky behavior. Previous research provided insight into the connection between teen positive and negative affect and risk-taking behavior. Negative affect is particularly powerful in explaining negative risk-taking behavior (Curry & Youngblade, 2006). Curry et al (2006) conducted a survey study with 290 14-20 year-olds to examine the relationship among anger and depressive symptoms, risk perception, self-restraint, and risk behavior and found that anger and perception of risk directly predicted risk behavior and that depressive symptoms indirectly effected risk behavior through perceptions of risk (Curry & Youngblade, 2006).

Positive parental communication also associated improved outcomes for youth regarding potentially risky behavior, such as drug and alcohol use and sexual behavior. Ennett et al (2001) found that rules and discipline communication predicted the escalation of adolescent substance abuse (Ennett et al., 2001). Aspy et al (2007) quantitative study of parental communication and

teen sexual behavior revealed that adolescents are less likely to initiate sexual intercourse if their parents discussed right and wrong, the importance of setting rules, being able to say no, and delaying sexual activity and family communication influenced important adolescent decisions such as birth control use and the number of sexual partners (Aspy et al., 2007). Some types of family communication do not lessen sexual experience in teens. Nikken & de Graaf (2014) found that restrictive parental mediation of media resulted in somewhat more sexual experience for teen girls (Nikken & de Graaf, 2013). During adolescence, the frequency and content of parent-child interactions change and patterns of disclosure, shared experiences, and perceptions of privacy and responsibilities are altered (Laursen & Collins, 2004). However, according to Riesch et al (2006) literature generally agrees that family communication processes are one of the characteristics associated with better outcomes in youth (Riesch et al., 2006). Online safety literature emphasizes that risk factors like behavioral problems or psychological or social issues make children more vulnerable to harm (Livingstone & Smith, 2014).

Based on these empirical findings, I anticipate:

H7: *For parents and teens, perceptions of teen positive affect will be positively associated with family communication*

H8: *For parents and teens, perceptions of teen negative affect will be negatively associated with family communication*

CHAPTER 3: METHODS

In this section, I will address the participant selection and data collection methods, the variables I will be studying, and our data analysis methods. A Qualtrics panel was used to select 215 teen-parent pairs to take a web-based survey. The paired responses provide a unique insight into teen-parent communication around online safety communication using a cross-sectional design. Questions addressed participant perspectives about online safety, parental mediation strategies, teen emotional states using Positive and Negative Affect scores (PANAS), and demographics. Composite variables were derived from the survey questions and tested for reliability and distinguishability. The variables were then analyzed using a paired t-test to answer RQ1 and multiple regression block analysis to answer RQ2. The paired t-test was used to observe the differences in the perceptions between parents and teens and the multiple regression model provides insight into the variables that influence teen and parental perception of communication. Participant selection, survey measures, and analysis approaches are described in detail next.

Participant Selection and Data Collection

After receiving IRB approval for our cross-sectional study, a Qualtrics Panel was used to distribute a survey to a sample of 215 parent and teen pairs residing in the United States. The participating teens were required to be between 13 and 17 years old. Parents or legal guardians who participated in our research were required to be at least 18 years old. We chose to collect data through a Qualtrics Panel as it enabled the ability to reach a nationally representative sample of our target demographic, filter out low-quality data, and prevent oversampling. Attention

screening questions were also included and Qualtrics removed participant pairs that failed the quality checks. Parents first provided consent for themselves and their teens and proceeded to take the survey. After parents finished, they were prompted to leave the room and allow their teen privacy to fill out their section of the survey. Each teen was asked for their consent at the beginning of their survey section. If the teens did not provide consent, they were not permitted to continue the survey and were not included in the sample. The survey consisted of demographic questions, measures evaluating teen and parent perceptions of their communication about online safety (dependent variable), as well as their concerns about online safety risks, strategies parents use to mediate online safety, and teen emotional state (independent variables). Pre-validated measures were used where possible. Teens and parents were asked the same questions with slight rewording based on the participant's relational role. For example, concerning monitoring, teens were asked "Do either of your parents sometimes check any of the following things?", while parents were asked, "Do either you or your teen's other parent check any of the following things?". This approach was used throughout the survey with the exception of a question concerning family income which was only asked of parents. The scale items are summarized below. Scale items and psychometric properties of the measurement model are presented in more detail in **Appendix A**.

Demographics. Teens and parents identified their sex and age. Parents were asked to select an annual household income range.

Family Communication. To measure parent and teen perceptions concerning parental initiative in communication about online safety, we asked the following four questions on a 5-point Likert scale (1 = Not at All, 5 = All of the Time): 1) initiates meetings to discuss problems

or issues the teen might be dealing with online, 2) talks to the teen about family rules about what he/she does online, 3) talks to the teen about how to resist peer pressure to do inappropriate things online, and 4) talks to the teen about how to engage safely with others while online.

Teen Online Risk Exposure. To measure the frequency of how often a teen encountered risks online, we used a composite variable of four questions asking how frequently a teen was subjected to the following events online: 1) Cyberbullying 2) Sexting 3) inappropriate material (such as pornographic, violent, self-harm) 4) Information sharing (personal or sensitive material without the owner's consent). The mean of the results on a 5-point Likert scale (1 = Not at all, 5 = Almost every day) provided meaningful insight into teen's online experiences. Questions were limited to teen's experience "within the past year".

Online Safety Concern. To measure online safety concerns regarding teen risk exposure, we drew from measures developed by Wisniewski et al. (P. Wisniewski et al., 2015) that provide insight into the frequency of four major types of online risks that teens may encounter online. Four questions evaluate how concerned the teens and parents are about the teen experiencing any of the following risks online: 1) online harassment 2) Sexual solicitations, exchanging sexually suggestive text-based messages or revealing/naked photos, or arranging to meet someone first met online for an offline romantic encounter, 3) viewing online content that could be considered pornographic, excessively violent, promoting illegal or morally deviant behavior, promoting self-harm (such as eating disorders, cutting, or suicide), and 4) information breaches such as interactions that involved sharing personal or sensitive information either without the owner's consent or that otherwise breached someone's personal privacy. All four items were measured on a 5-point Likert scale (1 = Not at all, 5 = A great deal).

Parental Mediation of Online Safety. To measure parent and teen perceptions concerning how parents mediate online safety for teens, we used metrics from Livingstone, et al (Livingstone et al., 2012). The measure included 22 questions to evaluate how often the parent engages in: 1) active mediation, such as talking to the teen about what they are doing online, 2) restrictions, such as limiting what kind of information they can share online, 3) monitoring, such as checking the messages in an instant messaging service, and 4) technical monitoring such as using parental control apps. Most items were measured on a 5-point Likert Scale (1 = Not at All/Never, 5 = All of the Time/Always). Questions about technical monitoring included an ‘I don’t know’ alternative for the teen (1 = I don’t know, 6 = All the time). This additional point on the Likert scale was included to provide insight into teen knowledge of parental choices.

Positive and Negative Affect. To measure parent and teen perceptions concerning the teen’s positive and negative affect, we used the Positive and Negative Affect Schedule (PANAS) (Baer, 1999). The measure included 10 questions to evaluate how 1) Joyful, 2) Sad, 3) Lively, 4) Proud, 5) Afraid, 6) Happy, 7) Miserable, 8) Mad, 9) Scared or 10) Cheerful the teen has been feeling over the previous two months. All items were measured using a 5-point Likert scale (1 = Not at All, 5 = Extremely).

Data Analysis Approach

First, I prepared our data for analysis. Composite variables were created to allow for the analysis of themes from the survey questions. The composite variable was created by taking the mean of all items in the subcategory. Next, the construct validity was assessed by using Cronbach’s alpha to ensure all composite variables met the reliability threshold of 0.7. **Appendix**

B includes the Pearson bivariate correlations between all the variables. I performed a preliminary analysis to determine the differences between our parent-teen pairs for each of our variables to address whether there is a difference between how teens and parents rank each variable (**RQ1**). These results were used to inform the linear regression models. Requirements and assumptions regression models were considered before analysis. I used IBM SPSS 24 to create two separate stepwise linear regression models, one for parents and one for teens to address **RQ2**. Their perceptions of their family communication concerning online safety were used as the outcome variable while considering sex and age of the parent-teen pairs and income of the household. The regression model was developed stepwise using teen online risk exposure (Block 1), online safety concern (Block 2), parental mediation of online safety (Block 3), and teen positive and negative affect schedule (Block 4). I chose to control the sequence of inclusion of independent variables in the models, the first block being considered, before the second, and so on, to obtain coefficients and statistics for specific blocks.

CHAPTER 4: RESULTS

This section discusses the demographics of the participants, test the construct validity and demographics of the variables I am studying (Family Communication, Teen Online Risk Exposure, Online Safety Concern, Parental Mediation Strategies, and Positive and Negative Affects), and perform paired t-tests between the variables to discover the differences in reporting between the teens and parents (**RQ1**). This paper describes the hierarchical multiple linear regression to create parent and teen models that clarify the independent variables influencing differences in teen/parent perceptions of communication (**RQ2**).

Descriptive Statistics

The majority of the 215 teen-parent pairs were female for both parents (67%) and teens (56.3%). The average income of the participants was between \$60,000 and \$80,000 with 46.6% of our participants falling in the range of \$30,000 to \$80,000. The teens were aged from 13 to 17 with the median age being 15. The parents were all at least 18 years old and their median age was between 35 and 44. Most parents, 79.5%, reported their teens lived in two-parent households. The ethnic origins distributions were similar between the teens and parents with 70% of parents reporting Caucasian/White, 13% Black, 13% Hispanic, and 4% from other origins.

Table 1. Reliability Metrics and Descriptive Statistics

| | Cronbach's α | | Mean | | St. Dev | | Skewness | | Kurtosis | | Mean Difference |
|------------------------------|---------------------|------|------|------|---------|------|----------|-------|----------|-------|-----------------|
| | Parent | Teen | P | T | P | T | P | T | P | T | |
| Family Communication | 0.87 | 0.89 | 3.45 | 3.60 | 0.93 | 0.93 | -0.62 | -0.55 | 0.19 | 0.02 | -0.15** |
| Online Risk Exposure | 0.87 | 0.94 | 2.38 | 1.76 | 1.53 | 1.10 | 0.96 | 1.54 | 0.17 | 1.19 | 0.62*** |
| Online Safety Concern | 0.95 | 0.95 | 2.93 | 2.32 | 1.41 | 1.34 | 0.05 | 0.68 | -1.44 | -0.92 | 0.62*** |
| Parental Mediation | | | | | | | | | | | |
| Active | 0.91 | 0.74 | 3.78 | 3.05 | 0.82 | 0.71 | -0.48 | 0.03 | 0.18 | -0.04 | 0.73*** |
| Restrictive | 0.86 | 0.87 | 3.39 | 3.49 | 0.86 | 1.00 | -0.57 | -0.56 | -0.10 | -0.30 | -0.10* |
| Monitoring | 0.92 | 0.93 | 3.28 | 3.05 | 1.10 | 1.11 | -0.29 | -0.04 | -0.77 | -0.82 | 0.23*** |
| Tech Monitoring | 0.94 | 0.95 | 2.52 | 3.18 | 1.29 | 1.48 | 0.42 | 0.27 | -0.98 | -1.11 | -0.66*** |
| PANAS | | | | | | | | | | | |
| Positive | 0.88 | 0.89 | 3.80 | 3.76 | 0.67 | 0.93 | -3.06 | -0.34 | 0.22 | -0.21 | 0.05 |
| Negative | 0.92 | 0.92 | 1.67 | 1.63 | 0.82 | 0.75 | 1.55 | 1.77 | 1.86 | 2.93 | 0.05 |

Note: p * \leq .05, ** \leq .01, *** \leq .001

The composite variables average the Likert Scale questions for each category: Family Communication, Online Risk Exposure, Online Safety Concern, Parental Mediation Strategies, and Positive and Negative Affects. Using Cronbach's alpha, I tested the reliability of all variables. As shown in Table 1, all metrics met the reliability threshold of 0.7 which suggests adequate construct validity. A paired t-test was used to observe differences in the perceptions between teens and their parents (**Table 1**). Based on the results from this test, it was found that teens reported a significantly higher frequency of family communication concerning their safety online compared to their parents. Parents were overall more concerned about online risks than their teens as they reported higher frequency of risk exposure and a higher amount of safety concern than their teens. For parental mediation, parents reported a significantly higher frequency of active mediation and monitoring than their teens, while their teens reported higher frequency of restrictive and technical monitoring strategies. Neither parents nor teens reported significantly different reports for the teen's positive or negative affect schedule over the past week. Overall, parents are more concerned about online risks than teens, while teens view their parents as more engaged around online safety communication than their parents believe they are.

These findings apply to teens and parents as a group and to the majority of individual pairs.

Teens that are more concerned about their online risk exposure than their peers have parents who are also more concerned about risks compared to parents in general.

Parent-Teen Models

To better understand the differences between parents and teens, and the independent variables influencing the participants' perceptions, I created two separate stepwise linear regression models. One model uses the parent's ranking of family communication about online safety. The second model describes the teen's ranking of family communication about online safety (**Table 2**). Each model illustrates the variables that influence teen and parent perception and provides insight into the differences between parent and teen perceptions.

Table 2. Hierarchical Regression Models

| | DV = Teen Family Communication | | | | | DV = Parent Family Communication | | | |
|--------------------------|--------------------------------|---------|---------|---------|--|----------------------------------|---------|---------|---------|
| | Block 1 | Block 2 | Block 3 | Block 4 | | Block 1 | Block 2 | Block 3 | Block 4 |
| R² | 0.04 | 0.124 | 0.418 | 0.459 | | 0.025 | 0.181 | 0.615 | 0.622 |
| Adj R² | 0.012 | 0.094 | 0.387 | 0.424 | | -0.003 | 0.154 | 0.594 | 0.598 |
| Variables | | | | | | | | | |
| Gender | | | | | | | | | |
| Parent | -0.006 | 0.042 | 0.114 | 0.086 | | -0.164 | -0.083 | 0.004 | 0.008 |
| Teen | -0.119 | -0.044 | -0.04 | -0.034 | | -0.138 | -0.091 | -0.112 | -0.096 |
| Age | | | | | | | | | |
| Parent | 0.012 | 0.011 | 0.009 | 0.008 | | -0.002 | 0.000 | 0.002 | 0.002 |

| | | | | | | | | | |
|----------------------|--------|----------|----------|---------------|--|--------|--------------|----------|----------|
| Teen | -0.006 | -0.036 | 0.012 | 0.026 | | -0.032 | -0.044 | -0.013 | -0.008 |
| Income | 0.000 | 0.001 | 0.001 | 0.001 | | -0.001 | -0.001 | -0.001 | -0.001 |
| Online Risk Exposure | 0.145 | -0.021 | -0.038 | -0.033 | | -0.029 | -0.058 | -0.035 | -0.047 |
| Online Risk Concern | | 0.247*** | 0.122* | 0.106* | | | 0.265** * | 0.066** | 0.059 |
| Parental Mediation | | | | | | | | | |
| Active | | | 0.27*** | 0.204** | | | | 0.551*** | 0.526*** |
| Restrictive | | | -0.157** | - 0.186*** | | | | 0.012 | 0.004 |
| Monitoring | | | 0.382*** | 0.357*** | | | | 0.152 | 0.146 |
| Tech Monitoring | | | 0.006 | -0.004 | | | | 0.125** | 0.124** |
| PANAS | | | | | | | | | |
| Positive | | | | 0.279*** | | | | | 0.122* |
| Negative | | | | 0.043 | | | | | 0.072 |

Note: p *<=. .05, **<=.01, ***<=.001

Teen Model: I created a regression model using variables as reported by the teens to explore the impact on teen’s perception of how much they believe their parents communicate about online safety (**Table 2**). This regression model was statistically significant with $F(12, 202) = 18.548, p < .000$ explaining 42.8% of the variance in the dependent variable. Teen concerns about online risks, perception of parents engaging in active, restrictive, and monitoring mediation, and teen positive affects (PANAS) are significant in this model ($p > 0.05$). All variables except restrictive parental mediation positively influenced a teen’s perception of

parental communication while restrictive mediation negatively influenced it. With each unit increase in online risk concerns caused family communication to increase by 0.106 points. Each unit increase in active parental mediation, teen score in online safety communication increased by 0.204, each unit increase in restrictive mediation resulted in a 0.186-point decrease in perceived family communication, and each unit increase in parental monitoring of internet use resulted in a 0.357-point increase for family communication. With each unit increase in positive PANAS, teen score in online safety communication increased by 0.279 points. No other variables in this model were significant.

Parent Model: I created a regression model using variables as reported by the parents to explore their impact on parents' perception of the frequency they communicate with their teens about online safety (**Table 2**). This regression equation was statistically significant with $F(12,202) = 34.412, p < .000$, and explaining 59.8% of the variance in the dependent variable. Active mediation of teens' online safety, using technical monitoring tactics, and a parent's reporting on their teen's positive PANAS positively influenced a parent's perception concerning how much they see themselves engaging in communicating with their teen about online safety ($p < .05$). With each unit increase in active mediation, parents score in online safety communication increased by 0.526 points, each unit increase in tech monitoring results in a 0.124-point increase in online safety communication, and each unit increase in PANAS results in a 0.122 point increase in online safety communication. Parents' concerns about the online risks teens face became a non-significant factor for the parental model with the addition of the PANAS score (Block 4). None of the demographic variables were found to be significant in this model.

Table 3. Summary of Hypothesis Testing Results

| Hypotheses | Teen Model | Parent Model |
|---|---------------|---------------------|
| H1: Online Risk Exposure <-> Family Communication (-) | Not Supported | Not Supported |
| H2: Online Safety Concern <-> Family Communication (+) | Supported | Partially Supported |
| H3: Active Mediation <-> Family Communication (+) | Supported | Supported |
| H4: Restrictive Mediation <-> Family Communication (-) | Supported | Not Supported |
| H5: Monitoring <-> Family Communication (+) | Supported | Not Supported |
| H6: Technical Monitoring <-> Family Communication (-) | Not Supported | Not Supported |
| H7: Teen Positive Affect <-> Family Communication (+) | Supported | Supported |
| H8: Teen Negative Affect <-> Family Communication (-) | Not Supported | Not Supported |

Table 3 shows the results in relation to our hypotheses. In our models, it was found that no significance with online risk exposure and family communication which suggests a lack of support for **H1**. There was a positive relationship between family communication and online safety concern in the teen model which supports **H2**, but this relationship became insignificant in the parent model after the addition of PANAS, therefore, only being partially supported. Both parents and teens found a positive relationship between active mediation, supporting **H3**. In the teen model, there was also a negative relationship with restrictive mediation (**H4**) and a positive relationship with monitoring (**H5**); however, neither **H4** or **H5** were supported in the parent model as it did not find those significant relationships. While the parent model found a significant relationship with technical monitoring, it was positive which is opposite than expected, the teen model did not find any significant relationship which shows a lack of support for **H6**. Neither model found a significant relationship with technical monitoring which implies a lack of support for **H6**. Both parent and teen models find that positive affect positively impacts

family communication which supports **H7**; however, it was found that no significance with negative affect in either model for **H8**.

CHAPTER 5: DISCUSSION

In this section, I will discuss the results of the cross-sectional study and the impacts they can make towards both future research and design. Family communication is vital for enhancing family functioning and protecting teens from risks online and in the outside environment (Baer, 1999; Ennett et al., 2001; Laursen & Collins, 2004; Liu, 2003). Increasing the understanding of online safety is theoretically and practically significant. While previous studies explore the gap in family communication, this paper contributes to identification of factors that close the gap in family communication from the perspectives of both parents and teens.

Disconnect Between How Parents and Teens View Family Communication About Online Safety

(RQ1)

The teenage years are an important transitional period in which teens gain independence and strive for autonomy (Baumrind, 2005; Youniss & Smollar, n.d.). Teens place a premium on independence, privacy, and trust and do not prefer restrictive techniques while parents value safety (Ghosh et al., 2018). However, teens do not want to be left to their own devices. They express a positive desire for monitoring and active mediation. While Ghosh (2018) implies that technical monitoring is negative, and teens certainly perceive it as negative, the study found that parents view technical monitoring as positive in their communication with teen about online safety (Ghosh et al., 2018). Parents may apply restrictive techniques in order to try and keep their teens safe (Ghosh et al., 2018). This profound disconnect in goals extends to teen and parent perceptions concerning their communication about online safety. The results confirmed a significant difference in the perceptions of the amount of communication between parents and

teens about online safety. Furthermore, different factors influence how much parents and teens believed they communicate. As already discussed, good family communication is protective for adolescents (Baer, 1999; Ennett et al., 2001; Laursen & Collins, 2004; Liu, 2003), so there is great value in understanding how to communicate better with teens as they traverse challenging and potentially dangerous online opportunities.

In addition to differences in perceptions about communication about online safety, it was found that disconnects between parent and teen rankings of concern of teen online risk exposure, actual teen risk experiences, and perceptions of parental mediation strategies (**Table 1**). The parent and teen view of active mediation as positive and the negative teen view of restriction are well known and established in the literature. This paper provides reinforcement and support through the analytical, regression models not previously applied to this data.

Parents perceive the risk as greater than teens perceive it. Teen's perception of risk may differ from their parents for a variety of reasons. Risk perception and judgement change over adolescence and early adulthood and teens are still developing their ability to accurately make risk judgements (Curry & Youngblade, 2006; Hartikainen et al., 2017) or parents may be overly risk adverse (Boyd & Hargittai, 2013). It may be necessary to heighten the safety concerns for teens specifically to improve family communication to give teens a sense of their online risk factors. Schoenebeck, et. Al. (2016) found that young adults sometimes find their past online behavior on Facebook embarrassing and adjust their behavior into adulthood (Schoenebeck et al., 2016). Improving teen understanding of their online safety and long-term consequences may improve the ability of teens and parents to have meaningful and positive interactions around their online communication. Empirical research is needed to better understand risk and harm in the

construct of teen experiences online and maturing teen perspectives over time. This addresses family communication in general, rather than a week-to-week approach. Longitudinal studies, spanning years rather than weeks or months that exploring the cumulative effects of online experiences as well as whether teen perceptions of their adolescent experiences change over time would be of great value in further understanding the protective factor of family communication for teens.

Differing Effects of Constructs for Teen and Parent Ranking of Family Communication (RQ2)

Many different factors impact parent-teen communication about online safety (**RQ2**). There was no significant relationship between teen online risk exposure and family communication (**H1**); however, there was a positive relationship between a teen's online safety concern and their perception of family communication (**H2**). This paper did confirm that there was a significant discrepancy among how teens and parents ranked their concern for online safety and exposure (**Table 1**) while also finding that a teen's concern of risk exposure positively impacted their family communication. While previous research found parents are very worried about online risks for teens, the likelihood of a child experiencing a risk is minimal according to previous research and children are more confident about their technical skills than their parents believe they are (Cohn et al., 1995; Hartikainen et al., 2017; Livingstone, 2009; P. J. Wisniewski et al., 2014). More studies, particularly studies that examine what children actually encounter online, could be useful in determining whether parents are overly concerned or teens are overly indifferent regarding their online experiences. While current studies suggest that children have confidence in their safety and do not believe they encounter significant risk, increased exposure,

and opportunities to engage online may alter teen's experiences. This is a significant area for ongoing study. Teens who are concerned about risk are more likely to view their parents as communicative. Since teen and parent risk perception moves together for pairs, this may reflect a family culture and attitudes regarding risk.

Research demonstrates that parental mediation strategies impact adolescent's online safety (Boyd & Hargittai, 2013; Hasebrink et al., 2011; Steinberg, n.d.; Tuominen, 2013). Prior work also investigated the ethical constructs of restrictive and technical monitoring strategies finding that while restriction and technical monitoring may reduce online risk exposure, they also limit access to opportunities, freedom, and transparency (Duerager & Livingstone, 2012; P. Wisniewski et al., 2015). Based on prior literature, I expected to find a positive relationship between family communication about online safety with active (**H3**) and monitoring (**H5**) mediation strategies but also find a negative relationship among communication and restrictive (**H4**) and technical monitoring (**H6**) mediation strategies. Confirming previous research, it was found that active mediation strategies to be positively associated with strong family communication (**H3**) and found a negative relationship between teen's view of family communication and restrictive monitoring (**H4**) (**Table 2**) (Ghosh et al., 2018). I was also only able to examine a significant relationship between communication and monitoring in the teen model (**H5**). In the parents' model, it was found that a positive relationship between technical monitoring and family communication instead of a negative one (**H6**) and no relationship in the teen model. Furthermore, there is a stronger correlation between parents reports of active mediation with family communication than for their teens. More research is needed to understand teen and parental approaches to communication about online safety. Of particular

interest, while teens take a negative view of restrictive monitoring, their parents do not. Parental mediation and monitoring are positive influences for teen perception of family communication. The findings suggest that teens view parental active and monitoring engagement as a powerful, and positive indicator of family communication. This positive view deserves consideration in future studies, particularly how that view develops over time and in the context of various teen experiences.

Blackwell, et al. (2016) found that both teens and parents want the other family members to focus less on devices during family time (Blackwell et al., 2016). This finding reflects positively on the teen's desire to connect and communicate with their parents. This study reveals a positive teen perspective of active and monitoring provides insight into how teens would prefer their parents communicate about online risks. Teens had a profoundly negative view of restrictive techniques. The most striking aspect of this finding is that parents did not view restrictive mediation as significant. For teens, restrictive monitoring is very significant. More research is needed to explore the differences between teen and parent perceptions, with particular attention to how parents can be encouraged to engaged in active mediation and monitoring, as these behaviors are more positively viewed by teens.

Teen positive affect is positively associated with family communication (**H7**), confirming results found already by previous research; however, contrary to previous studies, this paper did not find any relationship between family communication and teen negative affect (**H8**) (Curry & Youngblade, 2006; Kernis et al., 2008; Liu, 2003). This research was able to suggest a significant relationship between teen negative affect and a parent's concern about teen online risk exposure and a significant relationship between teen negative affect and a teen's report of

their online risk exposure (**Appendix B**). The literature supports the idea that positive family communication has a protective impact on adolescent experiences (Nikken & de Graaf, 2013). Emotional experiences impact both teens and parents. This study suggests a correlation between teen emotional state and family communication that warrants further study to understand the interactive effect of these two variables.

The regression results indicated that the state traits of the teen has a significant positive influence. PANAS has not previously been studied in this context, of particular interest is the potential influence parents or teens have on teen PANAS. It is recommended the development of a longitudinal study which includes PANAS, family communication, and teen risk experiences over time. A longitudinal study would provide the opportunity to evaluate changes in teen experience, suss out the relationship of PANAS as a cause or effect of family communication about online safety and allow understanding of how risk concern develops. It is vital to remember that while the survey represents a static moment, the adolescent experience is dynamic and shaped both within the parent-teen relationship and also subject to external influences both interpersonal and event related. To understand how risk, parental mediation strategies and emotional states develop overtime will greatly increase the understanding of family communication about online safety.

Implications for Design

Based on these results, it is found that teen's perceptions of family communication are positively impacted by their concerns about their online safety, active and monitoring mediation styles, and their positive emotional state, while restrictive mediation negatively impacted their

views on family communication. To best protect this communication and to allow parents to ensure teens are safely navigating the online space, I suggest future online safety solutions allow teens a more active role in their online safety and communication with their parents, rather than relying on restriction. Research demonstrated the importance of “good parents” to be proactive and take measure to protect their children (Boyd & Hargittai, 2013). While restrictive mediation strategies lower online risk exposure, also limited a child’s ability to gain crucial skills and opportunities (Duerager & Livingstone, 2012). This research found that both active and monitoring mediation strategies were successful in helping parents and teens have discussions on online safety, restrictive mediation strategies negatively impacted a teen’s experience without impacting the parents’ views (**Table 2**). Previous research also suggests teens dislike technical monitoring (Ghosh et al., 2018). Designing solutions that allowing a teen to take a more active role in their online safety will improve family communication.

Design solutions should strive to achieve the very difficult task supporting active mediation and monitoring and stive to encourage family communication directly. Restrictive mediation harms a teen’s view of family communication while also failing to increase a parent’s perception of family communication. Solutions for teen safety may currently be overly reliant on restriction (Duerager & Livingstone, 2012; Magkos et al., 2014). Technical restriction or rule-based restrictions are easier to implement in the design of technologies to support teen safety, but they are not the best choice to support family communication about teen safety. Design solutions may wish to consider teen emotional state based on future findings of the relationship between online safety communication and PANAS. Ackerman (2000) challenged the CSCW community to rise to the challenge of bridging the divide between social requirements and technological

feasibility. Design for active mediation and monitoring for teen safety provides just such a challenge in the current context of teen online engagement. Technical monitoring and restrictive designs are the easy solution. Designing technologies that will encourage improved parent and teen communication will be much more difficult, but potentially far more impactful and positive (Ackerman, 2000). Teens resent control, but welcome parental involvement. Technology which supports parental involvement in ways teens view as positive may very well have profound impact on improved family communication and teen safety online. As family communication is vital in reducing a teen's predisposition to risky behaviors (Aspy et al., 2007; Liu, 2003; Livingstone & Smith, 2014), I believe it is imperative that designers to promote family communication via their solutions instead of discouraging it. As this study shows, restrictive mediation causes a decline in teen's perceptions of communication. Therefore, this paper stresses the importance of creating design solutions that do not directly restrict teens online but instead promote transparency, teen involvement and teen-parent communication. The solutions should emphasize trust and allow both teens and parents to take an active role in maintaining online safety. Rather than simply blocking potentially inappropriate sites, parents could indicate what online content they view as inappropriate for teens (e.g. porn, self-harm, graphic violence). Any time a teen visits a website with content that is flagged, the teen might receive message saying the content is flagged and for what reason. After informing the teen of the risks, the teen could choose to either stop viewing the content or continue with the knowledge that the parent will be informed of their decision. This type of design could encourage active communication and monitoring, rather than restrictive approaches. It is crucial that parent teen interaction be a transparent process so the teen knows exactly what the parent can and cannot view. The report

sent to the parent should not include specific details, but only a brief description to allow the parent to bring up the topic in conversation. This design allows the teen to act with increasing autonomy while foster family communication.

Further research is needed to design specific tools that will mitigate teen online risk while supporting autonomy and family communication. The paired approach of parent teen pairs in this study yielded unique insight. A future study designed around participatory design or heuristic interaction design with parent-teen participants may reveal novel insight into parent-teen interaction and into designs that would support increased active family communication. Previous research supports the idea that children acknowledge and accept safety needs and parental controls (McNally et al., 2018). The children redesigning mobile monitoring applications emphasized family communication and teaching risk mitigation strategies (McNally et al., 2018). Further research is needed to understand design implications specific to adolescence. Our study suggests that family communication will continue to be an important aspect of these designs, while restrictive approaches will be minimized.

Limitations and Future Research

Despite the unique dyadic nature of the data set, certain limitations were encountered within the data itself. The data collection skewed towards female participants, both for teens, but even more strongly for parents. Therefore, findings for parents in particular may be more representative of the view of female parents compared to male parents. More study, looking particularly at differences in family communication around gender norms could potentially provide additional insights, although this paper did not find that gender was a significant variable

for any dependent variable. During our survey we requested parents to leave the room while their teens filled out the survey; however, there was no guarantee that the parents actually left. This could affect the teen's responses and therefore the results of the study.

Due to the correlative nature of the data set, it is not possible to determine which variables might influence outcomes for families. A longitudinal study is recommended to evaluate the interplay of risk, family communication styles and teen emotional states over time. Such a study would allow for greater understanding of how the variables interact over time and influence each other. A longitudinal study would be particularly impactful because of the developmental nature of adolescence. This paper noted that parent and teen risk perceptions moved in tandem with each other. While this paper did not find any demographic variables, such as age and gender, to positively impact the model, teen perceptions of risk may be subject to change over time as their ability to judge risk matures. The ability to measure changes in perception of risk, emotional state of teens, and teen and parent perceptions of family communication would provide great insight for future research.

CHAPTER 6: CONCLUSION

Teens and parents experience family communication about online safety differently. Parents feel they are communicating with their teenagers when they impose technical monitoring and use active mediation techniques. In contrast, teens experience restrictive measures as detrimental to communication and instead perceive positive communication with parents when the teen is in a more positive emotional state. The observation regarding positive emotional state, in particular, is a unique contribution of this work. This paper provides an argument for developing online safety solutions that allow teens to have an active role in their online safety and encouraging active parent-teen communication, transparency, and trust. This argument is supported through the regression analysis applied to the dataset, which revealed that parents and teens do not disagree in many areas. Both parents and teens find active parental mediation important in maintaining healthy family communication. Teens online concerns positively impact communication and restrictive mediation strategies decrease their perception of communication. Family communication is extremely important to maintain and I suggest design and research implications for future study that this research suggests will enhance both parent and teen views of family communication in the future.

Technology solutions that balance honoring teen's developing autonomy, encourage active mediation on the part of parents, and provide a balance of transparency with privacy is a challenging goal, but one that the CSCW community is uniquely equipped to address. The cross-sectional study provides insight into the factors which are most highly correlated with positive perceptions of family communication in online safety for parents and teens, both in relationship to each other and individually. Positive emotions during adolescence may be either the

antecedent or the outcome of improved family communication. Further, longitudinal studies are necessary to determine whether positive emotional states produce better family communication or better communication produces more positive emotional states for teens. In either case, this study shows that emotional state, active engagement, and mediation on the part of parents are more strongly correlated to positive views of family communication about online safety. It is vital that the CSCW community provide teens and parents with technologies that support active mediation for family communication about online safety.

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APPENDICES

Appendix A: Scale Items and Psychometric Properties of the Measurement Model

Parent model scale items

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| Measures of constructs |
| Family communication about online safety (M=3.45 SD=0.93) |
| 1. I initiate family meetings to discuss problems or issues my teen might be dealing with online. |
| 2. I talk to my teen about family rules about what they do online. |
| 3. I talk to my teen about how to resist peer pressure to do inappropriate things online. |
| 4. I talk to my teen about how to engage safely with others online. |
| Online Safety Concern (M=2.93 SD=1.41) |
| 1. Online interactions between your teen and others that involved someone treating another person in a mean or hurtful way, making rude or threatening comments, spreading untrue rumors, harassing, or otherwise trying to cyberbully another person. |
| 2. Online interactions between your teen and others that involved exchanging sexual messages (i.e. Sexting), sexually suggestive text-based messages or revealing/naked photos or arranging to meet someone first met online for an offline romantic encounter. |
| 3. Your teen viewing online content that could be considered pornographic, excessively violent, promoting illegal or morally deviant behavior, promoting self- |

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| Measures of constructs |
| harm (such as eating disorders, cutting, or suicide), or other online content that is generally deemed inappropriate for teens. |
| 4. Online interactions between your teen and others that involved sharing personal or sensitive information either without the owner's consent or that otherwise breached someone's personal privacy. |
| Teen Online Safety Risk Exposure (M=2.38 SD=1.53) |
| 1. Online interactions between your teen and others that involved someone treating another person in a mean or hurtful way, making rude or threatening comments, spreading untrue rumors, harassing, or otherwise trying to cyberbully another person. |
| 2. Online interactions between your teen and others that involved exchanging sexual messages (i.e. Sexting), sexually suggestive text-based messages or revealing/naked photos, or arranging to meet someone first met online for an offline romantic encounter. |
| 3. Your teen viewing online content that could be considered pornographic, excessively violent, promoting illegal or morally deviant behavior, promoting self-harm (such as eating disorders, cutting, or suicide), or other online content that is generally deemed inappropriate for teens. |
| 4. Online interactions between your teen and others that involved sharing personal or sensitive information either without the owner's consent or that otherwise breached someone's personal privacy. |

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| Measures of constructs |
| Active mediation of Teen Online Safety (M=3.78 SD=0.82) |
| 1. Talk to your teen about what he/she does on the Internet |
| 2. Explain why some websites are good or bad |
| 3. Suggest ways to use the Internet safely |
| 4. Suggest ways to behave towards other people online |
| 5. Help your teen when something bothers him/her on the Internet |
| Restrictive mediation of Teen Online Safety (M=3.39 SD=0.86) |
| 1. Give out personal information to others on the Internet |
| 2. Upload photos, videos or music to share with others |
| 3. Download music or films on the Internet |
| 4. Have his or her own social networking profile |
| 5. Have his or her own cell phone |
| 6. Use instant messaging |
| Monitoring Teen Online Safety (M=3.28 SD=1.10) |
| 1. Websites your teen visited based on his/her Internet browsing history |
| 2. Your teen's profile on a social network or online community |
| 3. Friends or contacts your teen adds to his/her social networking profile |
| 4. Messages in your teen's email or instant messaging account |
| 5. Text or photo messages your teen sends/receives on their phone |
| 6. The apps your teen installs or uses on his/her phone |

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| Measures of constructs |
| Technical monitoring of Teen Online Safety (M=2.52 SD=1.29) |
| 1. Use parental control technologies to block or filter some types of websites your teen visits |
| 2. Use parental control technologies to keep track of the websites your teen visits |
| 3. Use a service or contract that limits the time your teen spends on the Internet |
| 4. Use parental control technologies to monitor your teen's text or photo messaging activities from his/her cell phone |
| 5. Use parental control technologies to monitor what apps your teen installs or uses on his/her cell phone |
| Teen positive affect (M=3.80 SD=0.67) |
| 1. Joyful |
| 2. Lively |
| 3. Proud |
| 4. Happy |
| 5. Cheerful |
| Teen negative affect (M=1.67 SD=0.82) |
| 1. Sad |
| 2. Afraid |
| 3. Miserable |
| 4. Mad |

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| Measures of constructs |
| 5. Scared |

Teen model

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| Measures of constructs |
| Family communication about online safety (M=3.60 SD=0.93) |
| 1. My parents initiate family meetings to discuss problems or issues I might be dealing with online |
| 2. My parents talk to me about family rules about what I do online. |
| 3. My parents talk to me about how to resist peer pressure to do inappropriate things online. |
| 4. My parents talk to me about how to engage safely with others while online. |
| Online Safety Concern (M=2.32 SD=0.95) |
| 1. Online interactions between you and others that involved someone treating another person in a mean or hurtful way, making rude or threatening comments, spreading untrue rumors, harassing, or otherwise trying to cyberbully another person. |
| 2. Online interactions between you and others that involved exchanging sexual messages (i.e. Sexting), sexually suggestive text-based messages or revealing/naked |

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| Measures of constructs |
| photos, or arranging to meet someone first met online for an offline romantic encounter. |
| 3. Viewing online content that could be considered pornographic, excessively violent, promoting illegal or morally deviant behavior, promoting self-harm (such as eating disorders, cutting, or suicide), or other online content that is generally deemed inappropriate for teens. |
| 4. Online interactions between you and others that involved sharing personal or sensitive information either without the owner's consent or that otherwise breached someone's personal privacy. |
| Teen Online Risk Exposure (M=1.76 SD=1.10) |
| 1. Online interactions between you and others that involved someone treating another person in a mean or hurtful way, making rude or threatening comments, spreading untrue rumors, harassing, or otherwise trying to cyberbully another person. |
| 2. Online interactions between you and others that involved exchanging sexual messages (i.e. Sexting), sexually suggestive text-based messages or revealing/naked photos, or arranging to meet someone first met online for an offline romantic encounter. |
| 3. Viewing online content that could be considered pornographic, excessively violent, promoting illegal or morally deviant behavior, promoting self-harm (such |

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| Measures of constructs |
| as eating disorders, cutting, or suicide), or other online content that is generally deemed inappropriate for teens. |
| 4. Online interactions between you and others that involved sharing personal or sensitive information either without the owner's consent or that otherwise breached someone's personal privacy. |
| Active mediation of Teen Online Safety (M=3.05 SD=0.71) |
| 1. Talk to you about what you do on the Internet |
| 2. Explain why some websites are good or bad |
| 3. Suggest ways to use the Internet safely |
| 4. Suggest ways to behave towards other people online |
| 5. Help you when something bothers you on the Internet |

Appendix B: Correlations Matrix of All Model Variables

| N= 215 in all cases | | Family | | PANAS | | | | Online Safety Concern | | Teen Online Risk | | Parental Mediation of online safety | | | | | | | |
|-------------------------------|-----------------|----------|----------|-----------|-----------|----------|----------|-----------------------|----------|------------------|----------|-------------------------------------|----------|----------|----------|------------|----------|-----------------|----------|
| | | | | Positive | | Negative | | | | | | Active | | Restrict | | Monitoring | | Tech Monitoring | |
| | | Parent | Teen | P | T | P | T | P | T | P | T | P | T | P | T | P | T | | |
| Family Communication | P | 1.000 | | | | | | | | | | | | | | | | | |
| | T | 0.678*** | 1.000 | | | | | | | | | | | | | | | | |
| PANAS | Positive | P | 0.300*** | 0.287*** | 1.000 | | | | | | | | | | | | | | |
| | | T | 0.361*** | 0.359*** | 0.780*** | 1.000 | | | | | | | | | | | | | |
| | Negative | P | 0.103 | 0.026 | -0.233*** | -0.207** | 1.000 | | | | | | | | | | | | |
| | | T | 0.083 | 0.029 | -0.251*** | -0.212** | 0.863*** | 1.000 | | | | | | | | | | | |
| Online Safety Concern | P | 0.400*** | 0.283*** | 0.099 | 0.108 | 0.268*** | 0.252*** | 1.000 | | | | | | | | | | | |
| | T | 0.399*** | 0.330*** | 0.074 | 0.117 | 0.385*** | 0.365*** | 0.596*** | 1.000 | | | | | | | | | | |
| Teen Online Risk Exposure | P | -0.044 | -0.024 | -0.025 | -0.021 | 0.398*** | 0.335*** | 0.133 | 0.251*** | 1.000 | | | | | | | | | |
| | T | 0.236*** | 0.153* | -0.097 | 0.027 | 0.562*** | 0.542*** | 0.360*** | 0.542*** | 0.409*** | 1.000 | | | | | | | | |
| Parental Mediation Strategies | Active | P | 0.725*** | 0.652*** | 0.335*** | 0.412*** | 0.003 | 0.045 | 0.365*** | 0.287*** | -0.086 | 0.137* | 1.000 | | | | | | |
| | | T | 0.340*** | 0.340*** | 0.305*** | 0.274*** | -0.109 | -0.063 | 0.095 | 0.123 | -0.095 | -0.045 | 0.418*** | 1.000 | | | | | |
| | Restrict | P | 0.015 | -0.101 | 0.087 | 0.147* | 0.126 | 0.168* | 0.116 | 0.102 | 0.302*** | 0.238*** | 0.012 | 0.001 | 1.000 | | | | |
| | | T | -0.092 | -0.212*** | 0.062 | 0.060 | 0.104 | 0.118 | 0.074 | 0.024 | 0.249*** | 0.218*** | -0.089 | -0.115 | 0.777*** | 1.000 | | | |
| | Monitoring | P | 0.652*** | 0.514*** | 0.250*** | 0.252*** | 0.106 | 0.102 | 0.395*** | 0.352*** | 0.064 | 0.276*** | 0.450*** | 0.211** | 0.068 | 0.015 | 1.000 | | |
| | | T | 0.577*** | 0.547*** | 0.157* | 0.212** | 0.157* | 0.143* | 0.285*** | 0.365*** | 0.093 | 0.356*** | 0.514*** | 0.194** | 0.036 | -0.048 | 0.753*** | 1.000 | |
| | Tech Monitoring | P | 0.540*** | 0.447*** | 0.100 | 0.139* | 0.253*** | 0.243*** | 0.302*** | 0.422*** | 0.167* | 0.391*** | 0.450*** | 0.205** | 0.006 | -0.085 | 0.668*** | 0.641*** | 1.000 |
| | | T | 0.420*** | 0.396*** | 0.088 | 0.145* | 0.278*** | 0.278*** | 0.244*** | 0.370*** | 0.199** | 0.386*** | 0.356*** | 0.126 | -0.017 | -0.142* | 0.530*** | 0.647*** | 0.795*** |