

Parental Solicitation and Adolescent Disclosure In-Person and Using Technology:  
Associations with Parent-Child Closeness and Adolescent Outcomes

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## **Abstract**

Parents and adolescents communicate with each other both in-person and using technology. However, little is known about how communication using each medium is used to satisfy specific communication needs and relates to parent-child closeness and adolescent outcomes. Parental solicitation and adolescent disclosure are two forms of parent-child communication that are related to parent-child closeness and adolescent outcomes including depression, anxiety, delinquency, and prosocial behavior. Study one was designed to fill gaps in the literature by examining how and in what ways parental solicitation is one need that can be filled through communication in-person and using technology. Study two was designed to examine differences in parent-child closeness and adolescent outcomes based on adolescent disclosure in-person and using technology and discrepancies in parent and adolescent report of parental solicitation in-person and using technology. The final sample included 403 parent-adolescent dyads; statistical analyses, including correlation, t-test, ANOVA, and path analysis were conducted to explore relationships described above.

Results of these studies suggest that parental solicitation is one communication need that can be satisfied in-person and using technology, and that there are demographic differences in how frequently technology is used to satisfy needs for parental solicitation and adolescent disclosure. Additionally, differences in parent-child closeness and adolescent outcomes emerged based on whether adolescent disclosure occurred in-person or using technology. Finally, there were discrepancies in parent and adolescent reports of parental solicitation behaviors in-person and using technology and those discrepancies

were associated with parent-child closeness and adolescent outcomes. These studies contribute to the overall literature by increasing our understanding of how parents and adolescents specifically choose to communicate in-person or using technology based upon what they aim to gain from each conversation. In addition, findings help to inform parents and practitioners on when communication using technology might be beneficial to relationships and outcomes, and when communication using technology should be discouraged or even avoided.

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## **Introduction**

With the increasing availability of technology in recent years, many parents and adolescents communicate both in-person and using technology (Hessel, He, & Dworkin, 2017; Rudi & Dworkin, 2018). Researchers have identified parental monitoring behaviors (e.g., parental solicitation and adolescent disclosure) as important aspects of parent-child communication as these behaviors allow parents and adolescents to communicate openly (Cottrell, Branstetter, Cottrell, Harris, Rishel, & Stanton, 2007) and to give and receive advice (Chaparro & Grusec, 2015). However, there is a gap in our understanding of how communication in-person and using technology is used to satisfy specific communication needs and how the medium (in-person or using technology) chosen for communication is associated with parent-child relationships and adolescent outcomes including depression, anxiety, delinquency, and prosocial behavior.

Two studies are presented here; see Figure 1 for a conceptual model. Taking a uses and gratifications approach, I first examined how frequently parents and adolescents choose technology to satisfy specific communication needs (e.g., to say something they'd rather not say face-to-face), and how parent frequency of choosing technology to satisfy needs is related to parental solicitation in-person and using technology. Next, I examined whether adolescent frequency of choosing technology to satisfy needs changes the magnitude of (i.e., moderates) the relationship between parent frequency of choosing technology and parental solicitation in-person and using technology. Finally, demographic differences (parent and child gender, adolescent age, parent work status, parent education level, parents and adolescents living together full- or part-time) in parent

and adolescent frequency of choosing technology to satisfy specific needs, parental solicitation, and adolescent disclosure were examined.

Building upon study one, I more closely examined specific communication needs that parents and adolescents fill by communicating both in-person and using technology. Specifically, in study two I analyzed associations between parental solicitation and adolescent disclosure in-person and using technology, and adolescent outcomes including depression, anxiety, delinquency, and prosocial behavior. Further, parent-child closeness was examined as a mediating variable between adolescent disclosure in-person and using technology and adolescent outcomes. Finally, discrepancies in parent and adolescent report of parental solicitation behaviors were analyzed in relation to parent-child closeness and adolescent outcomes.

First, the existing literature relating to the use of technology for communication between parents and adolescents, parental solicitation, and adolescent disclosure is reviewed. Next, studies one and two will each be presented including an individual literature review, method, results, and discussion section for each. Finally, a section integrating implications and contributions from both studies will be presented.

## **Literature Review**

### **Adolescents, Parents, and Technology Use**

Across the existing literature, a vast majority of research findings indicate that most parents and adolescents communicate with each other using technology at least occasionally (Rudi & Dworkin, 2018; Vaterlaus, Beckert, & Schmitt-Wilson, 2019). This is not surprising given the salient use of technology among both parents and adolescents

today. Indeed, parents of teens in the United States are using media for approximately nine hours each day (Lauricella, Cingel, Beaudoin-Ryan, Robb, Saphir, & Wartella, 2016), while adolescents use media for more than seven hours daily (Rideout & Robb, 2019).

Vaterlaus and colleagues (2019) reported that 100% of parents and adolescents in their sample communicated with each other using at least one form of technology (e.g., calling, video chat, texting, emailing, social networking), and that communication using technology was associated with positive outcomes for parent-child relationships (e.g., increased parent-child closeness; Vaterlaus et al., 2019). However, communication using technology may not be beneficial in every situation. For some, technology may be a convenient and efficient way to quickly share information. For others, using technology may lead to miscommunications and misinterpretations of meaning (Hertlein & Ancheta, 2014), or adolescents feeling that their parent has invaded their privacy (Hawk, Keijsers, Frjins, Hale, Branje, & Meeus, 2013). Indeed, it may be that conversations that are brief or unemotional are appropriate to have through the use of technology (e.g., scheduling or making plans). Other conversations, including those involving emotional information (e.g., conflict with friends or family) may be better had in-person where individuals can discern nonverbal cues including facial expressions or body language.

Parents and adolescents make decisions about whether to communicate in-person or using technology, and intentionally choose which medium (in-person or using technology) to satisfy specific communication needs. When choosing technology, parents and adolescents also specifically select which form of technology to use, including

texting, FaceTime, or social media. One specific communication need that parents have is for parental monitoring, which includes parental tracking and surveillance of child whereabouts and activities (Dishion & McMahon, 1998). In particular, parents might feel the need to engage in monitoring behaviors because they feel a sense of responsibility and efficacy in helping their child become successful (Hoover-Dempsey et al., 2005). To satisfy this need for communication, parents *actively* attempt to understand the attitudes and behaviors of their children by soliciting, or directly requesting information from their child regarding their activities, whereabouts, thoughts, or feelings (Stattin & Kerr, 2000). In addition, adolescents need and desire close relationships with parents to obtain care and emotional support (Raising Children, 2018). Disclosing, or voluntarily sharing personal information with a parent strengthens parent-child relationships (Collins & Miller, 1994) and is an adolescent need that can perhaps be fulfilled by communicating either in-person or using technology.

Two forms of parent-child communication will be explored in these studies, parental solicitation and adolescent disclosure of information (Fletcher, Steinberg, & Williams-Wheeler, 2004; Stattin & Kerr, 2000). In most research examining parental solicitation and child-disclosure, the medium used for communication is not specified (e.g., “do you tell your parents what you did during the evening?”), though these conversations are occurring both in-person and via technology (Hessel et al., 2017; Rudi & Dworkin, 2018). It is essential to examine why individuals choose to communicate in-person and using technology, and to consider whether communication in-person and using technology are differentially associated with adolescent outcomes including

depression, anxiety, delinquency, and prosocial behavior. Understanding these associations will allow parents and practitioners to know when to encourage or discourage the use of technology for communication between parents and children.

### **Parental Solicitation**

Parental solicitation includes directly requesting information from a child regarding their whereabouts, activities, thoughts, or feelings (Stattin & Kerr, 2000). For example, when an adolescent returns home from an evening with friends, a parent may ask for information about where they were, who they were with, or what they were doing. A parent may also choose technology to solicit information by texting and asking their adolescent child where they are and who they are with while they are out. Parental solicitation both in-person and using technology can satisfy the need parents have to understand the attitudes and behaviors of their children and may also satisfy adolescent communication needs by allowing teens the opportunity to openly share information with their parent.

In the existing literature, parental solicitation has been identified as a positive aspect of parent-child communication as it is associated with increased adolescent disclosure (Baudat, Van Petegem, Antonietti, & Zimmerman, 2020; Hamza & Willoughby, 2011) and lower levels of antisocial behavior over time (Laird, Marrero, & Sentse, 2010). However, other research findings suggest that parental solicitation is linked with adolescents feeling that their parent is violating privacy rules (Hessel et al., 2017), or that they are being controlled by their parent (Laird, Zeringue, & Lambert, 2018), and has also been found to be associated with more adolescent secret-keeping

(Hawk et al., 2013). For some adolescents, parental solicitation may be perceived negatively due to the growing need for autonomy that develops in adolescence (Ryan & Deci, 2000; Wray-Lake, Crouter, & McHale, 2010). The way an adolescent perceives parental solicitation behaviors may be key in determining outcomes of parental solicitation.

Parents and adolescents often differ in their reports of parenting behaviors, and the parental solicitation literature is no exception. Indeed, parents report more frequent solicitation than adolescents report (Abar, Jackson, Colby, & Barnett, 2015); discrepancies have been associated with poor outcomes for adolescents including more frequently experiencing internalizing symptoms and engaging in externalizing behavior (Abar et al., 2015; De Los Reyes, Goodman, & Kliever, & Reid-Quinones, 2008). These differences may be due to variations in definitions and perceptions of parental solicitation between parents and adolescents (Guion, Mrug, & Windle, 2009). Understanding differences in perceptions of parental solicitation between parents and adolescents, and how those differences are associated with adolescent outcomes furthers our knowledge surrounding the consequences of when parents and adolescents are not in agreement on how frequently parental solicitation occurs.

### **Adolescent Disclosure**

Adolescent disclosure is another form of parent-child communication that satisfies both parent and adolescent needs as it includes children freely and willingly disclosing personal and private information to their parents. Parents benefit from adolescent disclosure as they gain more knowledge from what children tell them openly

than from information they solicit directly (Kerr, Stattin, & Burk, 2010); adolescents benefit by receiving emotional support (Raising Children, 2018) and advice from parents (Chaparro & Grusec, 2015), resulting in a strengthened parent-child relationship (Collins & Miller, 1994). In the existing literature, two forms of adolescent disclosure have been examined, routine and self-disclosure; both are reviewed below.

**Adolescent routine disclosure.** Routine disclosure includes parent-child conversations with adolescents voluntarily revealing what they do when parents are not around (the what, who, and where of daily life; Tilton-Weaver, Marshall, & Darling, 2014). For example, while an adolescent is at school, routine disclosure includes voluntarily telling a parent about their homework or plans after school by texting, calling, or using some other form of technology (e.g., social media). An adolescent may also choose to disclose routine information in-person when they return home. The information given in this type of disclosure is public, meaning that even when an adolescent chooses not to disclose routine information, parents can seek that information elsewhere by asking others (e.g., the adolescents' friends or friend's parents).

Adolescents vary in how frequently they choose to disclose information to their parents; research findings suggest that for most adolescents, frequency of routine disclosure decreases gradually from early to middle adolescence and increases again in late adolescence (age 16-18; Keijsers & Poulin, 2013). Padilla-Walker and colleagues (2018) examined adolescent frequency of routine disclosure across seven years (from ages 12-18) and found that the majority (82%) of adolescents followed the pattern above (gradual declines in early and middle adolescence and increases in late adolescence).

However, two other patterns of routine disclosure also emerged. First, 13% of adolescents reported low frequency of routine disclosure consistently across adolescence; second, 5% of adolescents reported a sharp decline in frequency of routine disclosure during early and middle adolescence with only a small increase in later adolescence. Both groups reported higher levels of delinquent behavior, lower levels of maternal warmth and prosocial behavior toward family at age 12, and higher levels of delinquency and substance use at age 18, as compared to the 82% who reported gradual declines in frequency of routine disclosure in early and middle adolescence, and increases in frequency of routine disclosure in late adolescence. As existing research findings suggest that routine disclosure is associated with adolescent outcomes including delinquency, substance use, and prosocial behavior (Padilla-Walker et al., 2018), it is important to build upon these findings by examining how outcomes differ based on whether communication occurs in-person or using technology. Due to inherent differences in how communication occurs in-person and using technology (e.g., convenience and ease, nonverbal cues including facial expressions or body language) it is likely that differences in outcomes will exist based on the medium selected for parent-child communication. Understanding these differences will allow researchers and practitioners to recommend or discourage the use of technology for routine topics of conversation.

**Adolescent self-disclosure.** Adolescent self-disclosure includes adolescents disclosing personal and private information deliberately and voluntarily (Allen, 1974), giving away more information than is required by the situation (Antaki, Barnes, & Leudar, 2005). Adolescent self-disclosure differs from routine disclosure in that the

emotional quality of self-disclosed information is greater (Laible et al., 2019); it includes personal, private, and sensitive information that cannot be obtained from other people (Tilton-Weaver et al., 2014). For example, after a night out with friends an adolescent would voluntarily disclose details beyond basic information such as who they were with, including private information such as feelings of frustration with one friend, or romantic feelings towards another friend. This type of disclosure may occur in-person or using technology.

Individuals carefully select whom they self-disclose private information to (Afifi & Steuber, 2009) and feel closest to those they disclose to (Collins & Miller, 1994). It is important to note that females and younger adolescents are more likely than males and older adolescents to disclose emotional information to their parents (Papini, Farmer, Clark, Micka, & Barnett, 1990), and that adolescents self-disclose more frequently to mothers than fathers (Smetana, Metzger, Gettman, & Campione-Barr, 2006). Regardless of age and gender, adolescent routine and self-disclosure are associated with positive outcomes for parent-child relationships, including open family communication and satisfaction with family relationships (Almas, Grusec, & Tackett, 2011; Papini et al., 1990), and adolescent behaviors such as prosocial behavior and empathy (Laible et al., 2019; Padilla-Walker et al., 2018).

### **Communication In-Person and Using Technology**

There are inherent differences in how communication occurs in-person and using technology, and it may be that parents and adolescents choose to solicit or disclose information using each medium according to the outcomes they desire from the

conversation. Communication in-person allows individuals to convey messages not just with words, but with tone of voice, eye contact, facial expressions (Burgoon, Guerrero, & Floyd, 2016; Mehrabian, 2017), and physical touch (Schroeder, Risen, Jino, & Norton, 2019). Additionally, research findings suggest that bonding between individuals occurs more deeply and quickly when communication occurs in-person as compared to communication using any form of technology (Sherman, Michikyan, & Greenfield, 2013). Accordingly, it may be that communication in-person is more beneficial to parent-child relationships and adolescent outcomes than communication using technology, as some important aspects of face-to-face communication (e.g., physical touch, eye contact) are missing when individuals connect using technology. In addition, communication via technology may be problematic as some parents and adolescents may spend less time communicating in-person due to the ability to communicate using technology (Sharaievska & Stodolska, 2017). Though little research has focused specifically on differences in outcomes based on whether communication occurs in-person or using technology, some research findings suggest that in-person parental solicitation is associated with lower levels of substance use, while solicitation using technology is not (Rudi & Dworkin, 2018). This is likely due to a number of factors, including that communication in-person allows parents and adolescents to physically see each other to better assess when something is wrong (e.g., visible signs of intoxication can be seen in-person), while communication using technology may make it difficult to perceive problems, convey meaning, and connect when not physically together.

On the other hand, the ability to communicate using technology when parents and adolescents are apart may improve upon existing communication patterns. For example, parents endorse text messaging as a form of parent-child communication because it facilitates contact when adolescents are at school or out with friends (Vaterlaus & Tulane, 2015). Further, the ability to communicate using technology may encourage conversations surrounding difficult or uncomfortable topics (e.g., sexual behavior, mental health) that parents and adolescents may be uncomfortable communicating about in-person. Research findings indicate that parent-child communication using technology has been associated with a number of positive outcomes, including increased connection with family (Sharaievska & Stodolska, 2017), and parent-child closeness (Vaterlaus et al., 2019).

The two studies presented here focus on how parents and adolescents choose to communicate in-person or using technology to satisfy specific communication needs (e.g., to avoid missing out, to say something they'd rather not say face-to-face), and on how the medium selected for communication impacts parent-child closeness and adolescent outcomes including depression, anxiety, delinquency, and prosocial behavior. Examination of these associations provides a foundation for future research to explore when communication using technology should be promoted or discouraged and increases understanding of how satisfying communication needs through the use of technology impacts individual outcomes and relationships.

### **Study One**

A vast literature exists describing how frequently technology is used by parents and adolescents (Rideout, 2016; Rideout & Robb, 2019). Other research focuses on the reasons *why* individuals use certain types of technology, and the gratifications they receive from such use, such as watching reality television for entertainment (Papacharissi & Mendelson, 2007). Communication between parents and adolescents occurs both in-person and using technology (Vaterlaus et al., 2019). From a uses and gratifications perspective, the choice of communicating in-person or using technology is made to fulfill certain communication needs. Parents and adolescents have a number of communication needs that can be fulfilled using technology, including connection when not physically living together (e.g., divorce; Wolman & Pomerance, 2012), or expressing affection and appreciation while apart (Chang, 2015; Fletcher, Benito-Gomez, & Blair, 2018). Taking a uses and gratifications approach, the current study was designed to examine the frequency with which parents and adolescents choose technology to satisfy specific needs, and how that frequency is associated with using technology for parental solicitation. Whether adolescent frequency of choosing technology to satisfy specific needs modified the strength of the relationship between parent frequency of choosing technology and parental solicitation in-person and using technology was also examined. Finally, demographic differences (parent and child gender, age, parent work status, parent education level, parents and adolescents living together full- or part-time) in frequency of choosing technology to satisfy specific communication needs, parental solicitation, and adolescent disclosure in-person and using technology were considered.

### **Theoretical Framework**

Historically, media use research considered viewers as passive consumers, influenced uniformly depending on media content (McQuail & Windahl, 1993). The uses and gratifications framework was the first theory to consider that individuals may actively view and select media based upon specific desires and motivations for use, including desires to pass time, avoid boredom, or to connect with others (Katz, Gurevitch, & Haas, 1973).

The following assumptions of the uses and gratification theory are relevant to the current study. First, parents and children actively choose to use media even when it competes with other sources of gratification (Katz et al., 1973). In this way, a parent may *choose* to use technology to solicit information from their child on a weekend night to *gratify* a need to know where their child is when they are not at home. Parents can also choose to gratify the need for communication by talking to their child when they arrive home, though the ability to use technology to solicit information competes with communication in-person as it satisfies the need for information more immediately. Likewise, a parent may also *choose* to express affection toward their child in-person to *gratify* their need to develop a more intimate relationship with their child. Choosing to communicate in-person competes with communication using technology as expressing affection in-person is often a more effective way to bond and connect (Sherman et al., 2013). In each of these situations, parents specifically choose from competing sources of gratification in order to most effectively achieve the need they aim to satisfy, such as gaining information or developing intimacy.

### **Communicating to Satisfy Specific Needs**

Parents and adolescents communicate both in-person and using technology (Vaterlaus et al., 2019); in most families, technology supplements and enhances, rather than replaces, in-person communication (Hampton & Ling, 2013). Studies have focused on the supplementary use of technology in a variety of relationships (e.g., couple, peer, and parent-child relationships), and findings suggest that communication using technology satisfies needs to stay in touch (McGee, 2014) or express emotional longing when in-person communication is not possible (Chien & Hassenzahl, 2020). In romantic relationships, using technology to communicate has been associated with the development of a secure attachment (Drouin & Landgraff, 2012) and increased intimacy (Ohadi, Brown, Trub, & Rosenthal, 2017), suggesting that using technology to supplement in-person conversation can positively impact relationships. On the other hand, communication via technology has also been linked with increased jealousy in peer relationships and with misunderstanding and conflict in parent-child relationships (Vaterlaus, Barnett, Roche, & Young, 2016).

### **Communicating to Satisfy Needs between Parents and Children**

Parents and children routinely communicate in-person and using technology (Rudi & Dworkin, 2018); communication using technology complements communication that occurs in-person. For example, parents report using technology to facilitate increased intimacy and affection, and to create a sense of family belongingness when children are away from home (Chang, 2015). These patterns of communication occur in-person when parents and children are physically together and are continued via technology when apart. In addition, technology is used between parents and children to express affection (e.g., I

miss you, I'm thinking about you; Chang, 2015; Fletcher et al., 2018), or to connect emotionally about daily events (e.g., to complain about a teacher at school; Fletcher et al., 2018). When not physically together, technology provides a way for parents and adolescents to discuss problems and provide support. When families are not living together and unable to communicate in-person regularly, they can choose technology to virtually supplement infrequent in-person communication (Yarosh & Abowd, 2013).

Parents and adolescents also choose technology to encourage the development of adolescent autonomy. Some research findings suggest that parents feel more comfortable granting freedom to their child after purchasing a cell phone for them because they can text to check-in anytime (Oksman & Turtianen, 2004). Because of technology, adolescents feel a greater ability to connect with their parent while spending time outside the home and also feel an added measure of independence knowing that they can reach out to their parent no matter where they are (Lenhart, Purcell, Smith, & Zickuhr, 2010). On the other hand, some parents and teens also report relationship tensions due to cell phone use (Lenhart et al., 2010). For example, some parents specifically choose technology to monitor adolescent behavior by surveying incoming and outgoing messages, examining their digital footprint (e.g., websites visited, pictures sent, etc.; Boyd & Hargittai, 2013) and geolocation. Parents may also start conversations with their child about what they do during their free time using technology (Rudi & Dworkin, 2018). However, there is a gap in our understanding of how or whether parents choose to communicate in-person or using technology to satisfy different needs, whether it be a need to talk about something they are uncomfortable saying in-person, or to communicate

about where their child is going after school. The current study focuses on understanding whether choosing technology satisfies the need for parental solicitation, and whether communication in-person and using technology satisfy distinct communication needs for parents and children. Generational (e.g., differences between parents and children), demographic (e.g., income, parent work status, parent education level), and developmental (e.g., adolescent age, parent and child gender) differences in choosing to solicit and disclose information using technology were also examined.

### **Developmental, Demographic, and Generational Differences**

Choosing technology to satisfy communication needs likely differs based on developmental, demographic, and generational differences. Regarding potential differences, tweens and younger adolescents are less likely to have their own cell phone than older adolescents (Rideout, 2016). Additionally, adolescents report higher levels of overall media use based on a number of demographic factors (e.g., lower socioeconomic status; Rideout, 2016; adolescents from single parent families; Padilla-Walker, Coyne, & Fraser, 2012). For adults, a recent PEW Internet study of mobile device ownership suggests that white adults who have obtained higher education and who report an annual household income of \$75,000 or above are more likely to own a smartphone than persons of other races, incomes, and education levels (PEW Research Center, 2019). These factors may impact how frequently individuals choose to satisfy needs in-person and using technology.

In addition, previous research findings suggest that younger adolescents are more likely to disclose information to their parents than older adolescents (Papini et al., 1990),

as perhaps adolescents choose to disclose less information as they develop autonomy throughout adolescence (Wray-Lake et al., 2010). Further, adolescent girls tend to disclose information to their parents more than adolescent boys (Papini et al., 1990), and both girls and boys are more likely to disclose to their mothers than their fathers (Smetana et al., 2006). However, it remains unknown whether differences in communication patterns between mothers, fathers, daughters, and sons (i.e., gender dyads) exist based on whether communication occurs in-person or using technology. Though we know that communication patterns typically change based upon adolescent age and parent-child gender dyad, there is a gap in our understanding of how the medium selected for communication may change based on these constructs. Examining demographic differences between parents and adolescents who communicate using technology is important for understanding in which contexts solicitation and disclosure using technology may be most beneficial.

### **Purpose and Significance of the Current Study**

To address the gaps in our understanding of how parents choose to communicate in-person and using technology to satisfy needs, three specific relationships were examined (see Figure 1, small dotted squares and lines). First, associations between parent frequency of choosing technology to satisfy specific communication needs and parental solicitation in-person and using technology were assessed. Examining these relationships is fundamental to understanding if parents specifically choose to solicit information in-person and using technology based on the information they are seeking,

and contributes to the field as it sets the stage for future research to explore how technology can be used to support communication in parent-child relationships.

Second, the current study explores whether adolescent frequency of choosing technology to satisfy needs changes the magnitude of (i.e., moderates) the relationships between parent frequency of choosing technology and parental solicitation in-person and using technology. Investigating these relationships provides greater understanding of how adolescent behavior is associated with the way parents choose to solicit information.

Finally, the ways in which developmental, demographic, and generational variables (e.g., adolescent age, parent and child gender, household income, parents and adolescents living together full- or part-time) are associated with decisions to solicit and disclose information in-person and using technology, as well as parent and adolescent frequency of choosing technology to satisfy specific communication needs were considered.

### **Research Questions**

**Research Question 1.** Are there demographic differences (gender, household income, age, whether parents and adolescents live together full or part-time, parent education level, parent work status) in parent and adolescent report of parental solicitation and adolescent disclosure in-person and using technology, and choosing technology to satisfy specific communication needs?

**Research Question 2.** Do parents and adolescents differ in how frequently they choose technology to satisfy specific needs (e.g., to avoid missing out, to say something they'd rather not say face-to-face)?

**Research Question 3a.** Is parental frequency of choosing technology to satisfy specific needs associated with parental solicitation in-person and using technology?

**Research Question 3b.** Does adolescent frequency of choosing technology to satisfy specific needs moderate the associations examined in research question 3a.

### **Method**

The following data collection information applies to both studies one and two. From October-December 2019, parent participants were recruited using Qualtrics, a company utilizing market research panels to recruit research participants. In this recruitment strategy, one parent of an adolescent child (ages 13-18) living in the United States was recruited via an email invitation directly from Qualtrics to participate in a study for research purposes. Participants were targeted based on demographic information in order to secure a representative sample of parents and youth. Specifically, participants were targeted according to US census data, and recruitment aimed for no more than 75% white participants, no more than 60% mothers, 50% of teens in early adolescence, a distribution of rural and urban participants similar to the US population, and household income trending toward a normal distribution. The majority of recruitment targets were met, and the final sample was fairly representative of the United States population in terms of race, gender, age, rural and urban living, and annual household income.

Parents who agreed to participate in the study provided consent and completed the 20-minute online survey. Within the survey, parents were provided with the opportunity to invite their youngest child within the target age range (13-18) to participate by

consenting for them to participate and providing the child's email address. When parents provided consent, an email with a link to the child survey was automatically sent to the child upon parent completion of the survey. Children were sent a reminder email three days after receiving the initial survey link; second and third reminders were sent one and two weeks later, as needed. Children (ages 13-17) provided assent or consent (age 18) to complete a child version of the survey, completed the 20-minute online survey, and were compensated with a \$10 Amazon gift card.

In total, 1,097 parents completed the initial survey. Twenty-two parents did not provide consent for their child to participate, 667 children were invited to participate but did not respond to the recruitment emails, and 5 parent participants were removed as it was determined that the same individual filled out both the parent and child survey. The final sample included 403 parent-child dyads (parent: 62% female, 38% male; mean age = 43.37 years; child: 51% male, 48% female, 1% transgender, mean age = 15.32 years). The majority of participants were white (parent: 68%; child: 66%), 21% of both parents and children were black, 4% of parents and children were Asian, nearly 2% of parents and children were American Indian or Alaska Native, and 5% of parents and 8% of children reported mixed race. Additionally, 56% of parents reported working full-time, with 14% working part-time, and 30% not currently employed outside of the home. In terms of parent education, 6% had less than a high school education, 23% were high school graduates, 36% completed some college (including an associate's degree or graduation from a technical school), 23% had obtained a bachelor's degree, and 12% had completed post graduate work. Finally, 65.5% of parents were married or living with

their partner, 17% were single and had never been married, 14% were divorced or separated, and 3.5% were widowed. Nearly all (92%) adolescent participants reported having their own cell phone.

## **Measures**

**Demographic information.** Parent and adolescent participants provided demographic information including age, gender, race, and whether they live with (part-time or full-time) the parent/adolescent also participating in the research. Parent participants provided additional demographic information including household income, marital status, employment status, and education level.

**Adolescent disclosure.** Two measures for adolescent disclosure were utilized. Both parents and adolescents reported on three items assessing routine disclosure from a modified version of the Kerr et al. (2010) Child Disclosure scale. Parents and adolescents were specifically asked to report on the parent/adolescent also participating in the study. Sample questions include, “How often do you tell your parent how you are doing in certain subjects in school?” and “If your child is out at night, how often do they tell you what they have done that evening?” Adolescents reported on an additional six questions focused on intimate or self-disclosure from a modified version of the Intimate Disclosure scale from the Social Provisions Questionnaire (Carbery & Buhrmeister, 1998). Sample questions include, “How much do you depend on your parent for help, advice, or sympathy,” and “How much do you talk to your parent about things you don’t want others to know.” Participants responded on a five-point Likert scale from 1 (*almost never*) to 5 (*almost always*). Questions were modified such that both parents and

adolescents were asked how often they have engaged in each activity both “in person” and “using technology.” This modification has been used in previous research (Hessel et al., 2017; Rudi & Dworkin, 2018).

Initially, the scales for routine and self-disclosure were going to be examined separately. However, after computing preliminary analyses, it was determined that the scales for adolescent report of their routine and self-disclosure were highly correlated (in-person:  $r = .71, p < .001$ ; using technology:  $r = .82, p < .001$ ). As a result of multicollinearity, the scales could not be examined separately in a single model. A Confirmatory Factor Analysis (CFA) was conducted to determine whether the factors for routine and self-disclosure loaded onto a single disclosure scale. The factors loaded appropriately onto a single disclosure scale, see Table 1 for factor loadings. As a result, two new scales for adolescent disclosure in-person and using technology were computed using a single mean score of both the routine and self-disclosure items (in-person:  $\alpha = .92$ ; using technology:  $\alpha = .96$ ).

**Parental solicitation.** A modified version of the Kerr et al. (2010) measure of parental solicitation was utilized in both studies. Adolescents reported on five items and parents reported on three items measuring parental solicitation behaviors. Parents and adolescents were asked to report on the parent/adolescent also participating in the study. Sample questions include, “How often do you ask your child about things that happened on a normal day?” and “During the past month, how often has your parent started a conversation with you about your free time?” Participants responded on a five-point Likert scale from 1 (*almost never*) to 5 (*almost always*). The original scale was modified

similar to the adolescent disclosure scales; participants were asked how often they or their parent engaged in each activity both “in person” and “using technology.” A mean score was computed for solicitation in-person and using technology (parent report in-person:  $\alpha = .75$ , using technology:  $\alpha = .85$ ; adolescent report in-person:  $\alpha = .82$ , using technology:  $\alpha = .93$ ).

**Choosing technology to satisfy specific communication needs.** Parent and adolescent frequency of using technology to satisfy specific communication needs was measured using a 6-item scale examining how frequently and in which circumstances parents and adolescents choose to communicate using technology. Questions included, “How frequently do you choose technology to communicate about things you find difficult to talk about face-to-face,” and “How frequently do you use technology because you find it easier to communicate online than in real-life.” Parent and adolescent participants responded on a six-point Likert scale from 1 (*never*) to 6 (*very frequently*). Scales for frequency of choosing technology to communicate were computed for both parents and adolescents separately using a mean score (parent:  $\alpha = .81$ ; adolescent:  $\alpha = .85$ ).

### **Data Analysis Plan**

Data were first explored in IBM SPSS Statistics (v.22.0). To answer research question one, frequencies, descriptive statistics, t-tests, and ANOVA’s were conducted to determine whether demographic differences exist between study variables. Next, to answer research question two, t-tests were conducted to determine whether parents and adolescents differ in their frequency of using technology to communicate. Finally, path

analysis was conducted in Mplus (v.8.1) to answer research question 3a. Path analysis is a form of Structural Equation Modeling (SEM) that examines causal relationships between independent and dependent variables using only manifest or observed variables. Model selection is based on model fit, parsimony, and interpretability (Collins & Lanza, 2010). The model fit statistics considered were chi square, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). Optimally, the chi square value is not significant, the CFI is greater than 0.9, and the RMSEA is 0.07 or less (Little, 2013). Parent frequency of choosing technology to satisfy specific communication needs was modeled as a manifest exogenous variable, with parental solicitation in-person and using technology modeled as endogenous manifest variables.

Moderation analysis allows researchers to understand whether one variable changes the magnitude of the relationship between two other variables. To answer research question 3b, adolescent frequency of choosing technology to satisfy specific communication needs was modeled as a manifest moderating variable to determine whether adolescent frequency of choosing technology to satisfy communication needs use impacts the strength of the relationships between parent frequency of choosing technology to satisfy communication needs and parental solicitation in-person and using technology. Moderation analyses were conducted by first centering variables for parent and adolescent frequency of choosing technology to satisfy specific communication needs and parental solicitation in-person and using technology for interpretability. Next, an interaction term was created by multiplying the centered variables for parent and adolescent frequency of choosing technology together. Parent frequency of choosing

technology to satisfy specific communication needs, and the interaction term combining parent and adolescent frequency of choosing technology to satisfy specific communication needs were modeled as a manifest exogenous variable, with parental solicitation in-person and using technology modeled as endogenous manifest variables. The Johnson-Neyman technique was then utilized to plot the effects of the interaction variable (Clavel, 2015). For this method, a loop plot was created in MPlus to test the magnitude of the moderation effect against a null effect. A graphical display of the test, including confidence bands around the effect, was created to aid in interpretation.

To determine which variables should be included as covariates in the path analyses for research questions 3a and 3b, correlations, t-tests, and ANOVA's including demographic variables and main study variables (choosing technology to satisfy needs, parental solicitation, adolescent disclosure) were examined. Demographic variables that were significantly related to any main study variable were included as control variables in the analysis. Controls included parent gender, child gender, child age, parent employment status, and parent education.

## **Results**

Descriptive statistics and correlations are reported in Table 2. To answer the first research question, t-tests were conducted to determine whether there were demographic differences between study variables. Results suggest that some significant demographic differences exist. Fathers reported significantly ( $p < .05$ ) higher frequency of adolescent disclosure ( $M = 3.89$ ) and parental solicitation using technology ( $M = 3.22$ ) than mothers (disclosure:  $M=3.68$ , solicitation: 2.94). Additionally, adolescents reported disclosing

significantly ( $p < .01$ ) more frequently to their fathers using technology ( $M = 3.32$ ) than to their mothers ( $M = 2.99$ ), and reported significantly ( $p < .05$ ) more frequent solicitation using technology from their fathers ( $M = 3.06$ ) than from their mothers ( $M = 2.80$ ; see Table 3). Additionally, parents reported significantly ( $p < .01$ ) more frequent disclosure using technology from their daughters ( $M = 3.89$ ) than sons ( $M = 3.62$ ; see Table 4). Finally, parents who lived with their child full-time reported significantly ( $p < .05$ ) higher levels of disclosure in-person from their child ( $M = 4.49$ ) than parents who lived with their child part-time ( $M = 4.14$ ; see Table 5).

Next, to examine differences in study variables based on parent income, parent education level, and parent work status, a series of one-way ANOVA's using Bonferroni post-hoc tests were conducted. Parents who attended some college ( $M = 3.56$ ) reported soliciting information in-person significantly ( $p < .05$ ) less frequently than parents with a post-graduate education ( $M = 4.00$ ; see Table 6). Additionally, parents with a high school education ( $M = 2.98$ ) and those who had attended some college ( $M = 2.86$ ) reported soliciting using technology significantly ( $p < .01$ ) less frequently than parents with a post-graduate education ( $M = 3.55$ ). Finally, children of parents with a high school education ( $M = 2.72$ ) reported significantly ( $p < .05$ ) less parental solicitation using technology than children of parents with a post-graduate education ( $M = 3.33$ ).

A series of ANOVA analyses using Bonferroni post-hoc tests also revealed significant differences by parent work status (see Table 7). Full-time working parents ( $M = 4.31$ ) reported choosing technology to satisfy specific communication needs more frequently ( $p < .01$ ) than parents who were not employed outside the home ( $M = 3.91$ ).

Additionally, full-time working parents reported less frequent ( $p < .01$ ) in-person adolescent disclosure ( $M = 4.38$ ) than parents who worked part-time ( $M = 4.65$ ) and parents who did not work outside the home ( $M = 4.54$ ). However, full-time working parents reported more frequent ( $p < .05$ ) adolescent disclosure ( $M = 3.90$ ) and solicitation using technology ( $M = 3.25$ ) than parents who did not work outside the home (disclosure:  $M = 3.57$ , solicitation:  $M = 2.68$ ). Children of parents who worked full-time reported significantly ( $p < .001$ ) higher frequency of disclosure using technology ( $M = 3.27$ ) and parental solicitation in-person ( $M = 3.85$ ) than parents who did not work outside the home (disclosure:  $M = 2.66$ ; solicitation  $M = 3.63$ ). Finally, children of parents who worked full-time ( $M = 3.10$ ) and part-time ( $M = 2.96$ ) reported significantly ( $p < .001$ ) higher frequency of parental solicitation using technology than children of parents who did not work outside the home ( $M = 2.53$ ). There were no significant differences between any study variables based on household income.

Finally, bivariate correlations were conducted using the Bonferroni correction to reduce Type 1 error (Curtin & Shultz, 1998). The correction is calculated by dividing the p-value (.05) by the number of variables in the correlation analysis (12). The new p-value needed for significance was .004. Results indicated that adolescent age was negatively associated with parent report of adolescent disclosure in-person ( $r = -.15, p = .003$ ), and adolescent report of parental solicitation in-person ( $r = -.16, p = .001$ ). In addition, parent age was negatively associated with parent ( $r = -.21, p < .001$ ) and adolescent frequency of choosing technology ( $r = -.15, p = .004$ ), parent report of parental solicitation using technology ( $r = -.19, p < .001$ ), adolescent report of adolescent disclosure using

technology ( $r = -.21, p < .001$ ), and adolescent report of parental solicitation using technology ( $r = -.21, p < .001$ ). It is important to note that parent and adolescent age were significantly and positively correlated ( $r = .28, p < .001$ ), and that correlations between parent age and other key variables may be due, at least in part, to the correlation between parent and child age.

To answer research question 2, a paired samples t-test was conducted to compare parent and adolescent frequency of choosing technology to satisfy specific communication needs. Adolescents reported more frequently choosing technology ( $M = 4.55, SD = 1.08$ ) than parents ( $M = 4.17, SD = 1.03; t(402) = 7.46, p < .001$ ).

To answer research question 3a, a path analysis was constructed in MPlus (v. 8.1) to examine the effects of parent frequency of choosing technology to satisfy specific needs on parental solicitation in-person and using technology (see Figure 2). Control variables were selected based on significant bivariate correlations with main study variables; parent and child gender, child age, parent employment status, and education were included in the model as exogenous manifest control variables. The model was fully saturated, so model fit statistics were not attainable and the overall model could not be evaluated; only coefficients are reported. Parent frequency of choosing technology to satisfy specific communication needs was positively associated with parental solicitation using technology ( $\beta = .39, p < .001$ ) and parental solicitation in-person ( $\beta = .10, p = .022$ ). Effect sizes for both pathways were small; see Table 8.

Finally, to answer research question 3b, adolescent frequency of choosing technology to satisfy specific communication needs was examined as a moderating

variable, to determine whether adolescent frequency of choosing technology changes the strength of the relationship between parent frequency of choosing technology and parental solicitation in-person and using technology. Overall, adolescent frequency of choosing technology significantly moderated the relationship between parent frequency of choosing technology and parental solicitation in-person ( $\beta = .07, p = .023$ ), though the Beta value was low. The Johnson-Neyman plot is included in Figure 3 (Clavel, 2015). Values of the moderating variable (i.e., adolescent frequency of choosing technology to satisfy needs) are shown on the X axis, with the effect of parent frequency of choosing technology on parental solicitation using technology on the Y axis ( $\beta$ ). The plot displays the adjusted effect of parent frequency of choosing technology on parental solicitation using technology across all continuous values of adolescent frequency of choosing technology. The region between where the confidence intervals (bolded outside lines) cross zero on the X axis indicates the region where the moderation is not significant. As the majority of the plot line (i.e., the thin center line representing values of the adjusted effect of parent frequency of choosing technology on parental solicitation using technology that correspond to the continuous values for adolescent frequency of choosing technology) is within the region where the moderation is not significant, it was determined that despite overall significance, adolescent frequency of choosing technology to satisfy needs did not change the magnitude of the relationship between parent frequency of choosing technology and parental solicitation using technology.

Adolescent frequency of choosing technology to satisfy needs did not moderate the relationship between parent reasons for using technology and parental solicitation using technology ( $\beta = .001, p = .98$ ).

## **Discussion**

The current study was rooted in the Uses and Gratifications theory (Katz et al., 1973), and revealed that parental solicitation is a specific need parents gratify both in-person and using technology; this seems to be true even among parents who frequently choose technology to communicate. There are a number of factors that are important to discuss when considering which medium parents and adolescents choose to satisfy communication needs, including understanding the overall goal (e.g., intimacy, topic) of the conversation between parent and child, and the ways communication needs change across adolescence.

Decisions regarding which medium to use to communicate may be made based upon the level of intimacy desired for the conversation. For example, research indicates that bonding between individuals occurs more deeply when communicating in-person (Sherman et al., 2013). When physically together, parents and children are able to convey meaning through tone of voice (Burgoon et al., 2016; Mehrabian, 2017), and can connect through physical touch (Schroeder et al., 2019). When seeking to connect intimately with their children, parents may choose to communicate in-person because of these important aspects of face-to-face communication. Conversely, communication via technology may be selected for less emotional topics, including scheduling or making plans. Conversations via technology tend to be concise and asynchronous (Kelly, Keaten,

Becker, Cole, Littleford, & Rothe, 2012), typically allowing for less emotional connection than an in-person conversation. Parents may also specifically choose technology to introduce conversations topics that are sensitive (e.g., sexual behavior). To illustrate, a parent may begin a conversation with their child over text messaging about substance use among other adolescents at school. Later, when the parent and adolescent are physically together, the parent may reintroduce the topic specifically focused on personal substance use. In this situation, technology supplements in-person conversation by allowing the parent to more comfortably initiate an important and sensitive conversation.

In the current study, 55% of parents reported that they at least occasionally felt like technology was the only way to talk to their child. Even though research suggests that many adolescents do not feel this way (Lachance, 2020), it is likely that what parents perceive about their child's feelings toward communicating impacts how parents choose to communicate. For example, if a parent believes that their child does not want to talk in-person, the parent may choose to solicit information using technology in order to gratify their need to obtain information from their child while respecting their child's need for autonomy.

Differences in communication patterns between parents and adolescents may also be due to developmental, demographic, and generational differences in how comfortable and familiar individuals are with technology. Findings of the current study revealed that adolescents more frequently chose technology to satisfy specific needs than parents did. This is not surprising given that adolescents are digital natives (Prensky, 2001), which is

evidenced by the fact that 92% of teens use the Internet daily, and 75% report texting their friends at least every couple of days (Rideout & Robb, 2019). Conversely, the average age of parents in the sample was 43; these parents are considered *digital immigrants* as they did not grow up using technology to communicate (Prensky, 2001), and have likely spent years developing other patterns and methods for satisfying communication needs.

In addition to parents choosing technology to satisfy specific communication needs less frequently than adolescents, there are also differences in how parents and adolescents communicate based on adolescent age. More specifically, findings showed that adolescent age was negatively correlated with parent report of adolescent disclosure and adolescent report of parental solicitation in-person. It is likely that younger and older adolescents differ across in-person communication patterns because communication needs, and the way those needs can be satisfied, change throughout development. Research shows that older adolescents spend more time with peers and away from parental supervision (Lam, McHale, & Crouter, 2014), which would allow for less time to communicate in-person. It is worth pointing out that there were no significant associations between adolescent age, solicitation, and disclosure using technology, so it may be that parents and adolescents simply communicate less frequently (and do not shift communication to another medium) as adolescents get older (i.e., develop increasing autonomy; Wray-Lake et al., 2010).

A number of key developmental theorists agree that autonomy is an essential developmental task in adolescence (Steinberg & Silk, 2002). Developmentally, younger

adolescents may require more involved parenting practices, including more stringent parental monitoring. However, as children age, parents likely recognize shifts in communication patterns (Keijsers & Poulin, 2013) and autonomy (Wray-Lake et al., 2010), and may allow for these developmental changes by soliciting less information in-person from their older adolescent children.

It is just as likely that adolescents disclose less information in-person to their parents as they establish autonomy and independence. These findings support previous research which suggests that younger adolescents are more likely to disclose information to their parents than older adolescents (Papini et al., 1990). Relatedly, the boundary of information included in an adolescent's "personal jurisdiction," (or information they feel applies only to the self and should not be regulated by parents) widens as adolescents get older (Wray-Lake et al., 2010), and older adolescents may share less information with their parents as they begin to expand their definition of what types of information are included within their personal jurisdiction. In addition, parents may solicit less information as they allow their child's personal jurisdiction to grow.

### **Limitations and Future Directions**

The current study was not without limitations. First, the data are cross-sectional in nature and directionality of the findings cannot be determined. It is important to examine these associations longitudinally to better understand how parents use technology to satisfy needs over time, and whether communication needs and patterns differ developmentally across adolescence. In addition, the data were self-reported and collected using an online survey. Self-reported data are subject to participants under or

overestimating behaviors depending upon factors of social desirability (Van de Mortel, 2008), or participants reporting incorrectly due to an inability to recall past behaviors or events (Althubaiti, 2016). However, it is also possible that when reporting technology use behaviors, self-reported data is most accurate as other individuals may not be aware of how frequently others choose technology to satisfy needs. Future research should examine and compare self-reported and other-reported data of technology use for communication. Finally, online data collection is a relatively inexpensive way to collect data from many participants quickly, and can specifically target individuals of various race, age, gender, and income to assemble a diverse sample (Heiervang & Goodman, 2009). However, research findings suggest that online data collection can be subject to self-selection bias (Bethlehem, 2010), meaning that participants who self-select participation in online surveys differ in important ways from those who do not participate. For example, recent research findings suggest that the digital divide (e.g., division in access to technology based on income) still impacts technology use among teenagers today, as children from higher income homes are more likely than peers from lower income homes to have access to a computer or the internet at home (Rideout & Robb, 2019).

Next, while the measure for parent and adolescent frequency of choosing technology measured how frequently individuals choose technology to satisfy communication needs, the measure was not specific to parent-child communication. It is important to recognize that there may be differences in how frequently technology is chosen to satisfy communication needs within the parent-child relationship in comparison

to other relationships (e.g., romantic partner, friends). Future research should specifically examine how frequently technology is used to satisfy communication needs in parent-child relationships. In addition, the current study identified that communication in-person and using technology are used to satisfy needs for parental solicitation. Further research is needed to understand which specific needs are satisfied with communication in-person versus communication using technology. For example, qualitative interviews of parents and children could be conducted to gain a rich understanding of the specific topics and situations that are most effectively discussed in-person and using technology. This would inform future research on how communicating to satisfy specific needs occurs using technology and would allow researchers to better understand when to encourage or discourage technology use between parents and children.

It is also likely that the survey items used to measure parental solicitation and adolescent disclosure (e.g., discussing whereabouts, school, feelings, etc.) did not capture the full range of topics discussed by adolescents and their parents. For example, older adolescents and parents may be discussing future plans for college or work after high school graduation, which would not have been captured in the parental solicitation questions. Further, some conversations between parents and children require multiple discussions, while others can be communicated in one conversation. The content and frequency of information discussed in important parent-child conversations will likely differ based upon adolescent age, and future research should examine which topics parents and adolescents are primarily discussing at each developmental stage to better understand when and how important conversations occur.

Finally, this study identified important developmental, generational, and demographic differences in frequency of choosing technology to satisfy communication needs, parental solicitation, and adolescent disclosure using technology. However, it is also important to note that many differences in solicitation and disclosure were identified based on parent work status. It is difficult to speculate about what these findings mean without more information on the type of job each parent has. For example, some parents who work full-time may work from home, while others may work away from home in an office or traveling. In addition, parent work status impacts parent stress, access to technology, finances, and access to resources that were not considered in the current study. Future research should examine parent work status in greater depth (e.g., industry, where the parent works from, how many hours they spend away from home, income, work stress, etc.) to better understand how parent work status is associated with the use of technology for family communication.

### **Conclusion**

Findings from the current study provide evidence that communication in-person and using technology each satisfy needs for parental solicitation. In addition, the study provides a foundation for future research to examine in which contexts using technology to satisfy communication needs between parents and children is most beneficial, and when communication using technology should be promoted or discouraged. Building on parental solicitation being one need that is satisfied through the use of technology, study two will examine adolescent outcomes (depression, anxiety, delinquency, prosocial

behavior) associated with choosing to engage in parental solicitation and adolescent disclosure in-person and using technology.

## **Study Two**

Parents and adolescents share information with each other in a variety of ways, including conversations in-person and using technology. Study one identified that parents and adolescents specifically choose to communicate in-person and using technology in order to satisfy needs for parental solicitation. Study two builds upon these findings by examining outcomes (depression, anxiety, delinquency, prosocial behavior) related to engaging in parental solicitation and adolescent disclosure in-person and using technology.

Existing research indicates that parental solicitation and adolescent disclosure in-person are linked with lower levels of delinquency and depression (e.g., Garthe, Sullivan, & Kliwer, 2018), and that the effectiveness of parental solicitation and adolescent disclosure depends greatly upon the climate of the parent-child relationship (i.e., warm and supportive, controlling; Baudat et al., 2020). Parental solicitation and adolescent disclosure take place in-person and using technology (Rudi & Dworkin, 2018). That being said, there are inherent differences in how these forms of communication occur according to the medium used. Some of these differences include synchronicity and length of conversation (Kelly et al., 2012), as well as features of face-to-face communication including tone of voice (Burgoon et al., 2016; Mehrabian, 2017) and physical touch (Schroeder et al., 2019). One study suggests that parental solicitation and adolescent disclosure are more effective in-person than using technology (Rudi &

Dworkin, 2018), though little research has examined whether the medium used (in-person, using technology) for parental solicitation and adolescent disclosure impacts adolescent outcomes.

The current study will fill extant gaps in the literature by examining, 1) associations between parental solicitation and adolescent disclosure in-person and using technology, 2) associations between adolescent disclosure in-person and using technology and adolescent outcomes, 3) parent-child closeness as a mediating factor between disclosure in-person and using technology and adolescent outcomes, and 4) whether discrepancies in parent and adolescent report of parental solicitation are related to parent-child closeness and adolescent outcomes.

### **Theoretical Framework**

The Communication Privacy Management theory (CPM; Petronio, 1994) provides a framework for understanding how adolescents make decisions about concealing or revealing private information from or to others. The CPM theory suggests that individuals have a right to control the concealing or revealing of their own private information by setting personal rules or boundaries to include or exclude others from receiving certain types of information (Petronio, 2015). For example, an adolescent may share information about their romantic relationship with close friends, but may keep their relationship a secret from their parents, thereby setting a boundary. Boundaries that exclude all individuals from receiving information are closed, and as individuals share information with others, boundaries become increasingly open (Petronio, 2015).

Adolescent boundary management may raise problems in the context of the parent-child relationship, because parents may feel they have a right to know what their adolescent is doing, while children may feel they have a right to keep information private. Because adolescents are owners of their own private information, parental solicitation may be appropriate in small doses, but could become problematic when parents solicit too frequently or ask for too much information, leading to privacy concerns (Hawk, Keijsers, Hale, & Meeus, 2009) and perceptions of obstructed autonomy on the part of adolescents (Ryan & Deci, 2000).

The CPM further describes that adolescents are balancing paradoxical constructs: privacy and intimacy (Petronio 1991, 2002, 2010). Though adolescents may wish to establish autonomy and independence by keeping information private, they also desire close relationships and may accordingly expand the boundary around personal information to achieve this need (Finkenauer, Engels, & Kubacka, 2008; Finkenauer, Kerkhof, & Pronk, 2018). It is possible that adolescents who expand their privacy boundary and disclose information to their parents will experience a closer parent-child relationship, while it is also possible that adolescents who too openly disclose information (e.g., details about sexual activity), give parents more detail than they wish to receive, weakening the parent-child relationship.

Though the CPM theory had its beginnings in the public health and trauma fields (e.g., doctors and patients disclosing diagnoses, disclosing experience with sexual abuse), research has applied CPM to family relationships for many years. First, individuals within a family manage their own personal information by sharing with one or more

family members to create co-owned pieces of information between marital partners, siblings, or parents and children (Petronio, 2010). In addition, whole families collectively own pieces of information and establish privacy rules about sharing information with non-family members (Morr Serewicz & Canary, 2008). Within the parent-child relationship, researchers have examined CPM in reference to privacy concerns that stem from parents and children connecting via social media (e.g., adolescents feeling that their parent is invading their online privacy; Child & Westermann, 2013; Kanter, Afifi, & Robbins, 2012; Mullen & Fox Hamilton, 2016).

### **Solicitation and Disclosure In-Person and Using Technology**

The extant literature on parental monitoring has focused on parental solicitation and adolescent disclosure without specifying the medium used for the conversation, generally assuming in-person communication. Little research has specifically studied parental solicitation and adolescent disclosure using technology (Rudi & Dworkin, 2018). In this increasingly digital age, the ability to use technology is important as it allows parents to monitor adolescent behavior even when parents and children are not together (Rudi, Dworkin, Walker, & Doty, 2015).

Features of nonverbal communication (e.g., physical touch, facial expression, and tone of voice; Burgoon et al., 2016; Mehrabian, 2017; Schroeder et al., 2019, Sherman et al., 2013) express emotion and meaning, but are missing when individuals communicate using technology. This may result in misunderstanding or misinterpretation of meaning (Hertlein & Ancheta, 2014). These things aside, parent solicitation and adolescent disclosure may be protective against negative outcomes regardless of the medium used to

share the information, and parents and adolescents may benefit greatly from the ability to communicate using technology when not physically together. Indeed, it is likely that although some features of in-person conversation are lost when communicating using technology, others are gained (e.g., convenience, immediacy).

Only one study, to my knowledge, has examined differences in the effectiveness of parental solicitation in-person and using technology. Authors found in-person parental solicitation to be associated with increased parental knowledge and decreased substance use, while solicitation using technology was not associated with either construct (Rudi & Dworkin, 2018). As an extension of these findings, it is possible that differences in depression, anxiety, delinquency, and prosocial behavior will emerge depending on whether information is solicited or disclosed in-person or using technology. For example, research suggests that some adolescents see technology and media use as part of their personal domain (or an area of their life they feel they should have control over and should be able to keep private; Hessel et al., 2017), and having a parent solicit information using technology may feel overly intrusive. On the other hand, with the salient nature of technology use among adolescents today, outcomes of adolescent disclosure using technology may not differ from in-person disclosure. It is also possible that outcomes relating to parental solicitation and adolescent disclosure in-person and using technology will differ based on the content and intent of each conversation. The current study was designed to expand upon previous research by examining adolescent disclosure and discrepancies in parent and child report of parental solicitation in-person

and using technology, and potential outcomes of these communication behaviors including depression, anxiety, delinquency, and prosocial behavior.

**Discrepancies in parent and child report of parental solicitation.** Finding discrepancies between parent and child reports of parenting behavior is common in the literature. Initially, a number of authors suggested that discrepancies in parent and child reports of behavior were due to measurement error (e.g., De Los Reyes, 2011). However, many studies report low to moderate correspondence between parents and adolescents (De Los Reyes, Ohannessian, & Laird, 2016; Guion et al., 2009), and discrepancies in parent and child report remain consistent over time (De Los Reyes, Goodman, Kleiwer, & Reid-Quinones, 2010). Importantly, research findings have revealed that discrepancies in parent and child reports of parenting behaviors can be uniquely predictive of outcomes in adolescence, while individual parent and adolescent reports of parenting behaviors were not associated with the same outcomes (De Los Reyes et al., 2010). These findings suggest that discrepancies in parent and child report of parenting behavior are important to examine as they distinctly and uniquely influence adolescent outcomes, beyond individual reports.

There are a number of reasons why discrepancies in parent and adolescent report of parenting behaviors might exist. Some research findings point to differing perceptions of parental behavior as reasons for discrepancies (Guion et al., 2009). For example, Guion and colleagues (2009) found that parents viewed harsh parenting behaviors (e.g., slapping, yelling) as adaptive behaviors that signaled nurturing and caring, while adolescents did not view harsh parenting behaviors as nurturing or caring. Parents may

view parental solicitation as a way to nurture and care for their child, while adolescents might perceive parental solicitation as an invasion of privacy.

There is also evidence that the desire for increased autonomy that occurs in adolescence (Wray-Lake et al., 2010) explains discrepancies in parent and child report of parenting behavior. Discrepancies may naturally occur as adolescents seek independence and autonomy from parents. According to the CPM theory (Petronio, 2004), adolescent information management is key to establishing autonomy, and parenting strategies are most effective when delivered in a way that reinforces adolescent autonomy (Ryan & Deci, 2000).

In the existing literature, discrepancies in parent and child reports of parenting behaviors have been associated with internalizing symptoms and externalizing behaviors (Abar et al., 2015; De Los Reyes et al., 2008; De Los Reyes et al., 2010; Dimler, Natsuaki, Hastings, Zahn-Waxler, & Klimes-Dougan, 2017). For example, one study examined discrepancies in parent and adolescent report of parents' responses to adolescent anger (e.g., "when your child is angry, what do you do?"), by rating how parents typically reacted with three negative parental responses (punishment, magnification, neglect; Dimler et al., 2017). Findings revealed that adolescent externalizing behaviors occurred when adolescents perceived and reported more negative parenting behaviors than parents reported. Additionally, Abar and colleagues (2015) specifically examined discrepancies in parent and adolescent report of parental solicitation, parental knowledge, and parental control and found that discrepancies in parental knowledge and parental control were associated with increased adolescent

substance use. The current study has been designed to expand upon the existing literature by examining how discrepancies in parent and child report of parental solicitation are associated with adolescent outcomes (e.g., depression, anxiety, delinquency, prosocial behavior) and parent-child closeness.

### **Adolescent Depression, Anxiety, Delinquency, and Prosocial Behavior**

Depression, anxiety, delinquency, and prosocial behavior are commonly studied outcomes in the adolescent literature (e.g., Clayborne, Varin, & Colman, 2019; Pinquart, 2017); these constructs provide valuable information on adolescent well-being and both positive and negative aspects of development (e.g., Memmott-Elison, Holmgren, Padilla-Walker, & Hawkins, 2020). Indeed, an adolescent who is not thriving is less likely to participate in prosocial or helping behaviors, and may be more susceptible to delinquent behavior, depression, and anxiety.

Frequency of adolescent disclosure is negatively associated with depression and delinquency (Fernandez, Loukas, & Pasch, 2018; Padilla-Walker & Son, 2019), and is positively associated with prosocial and moral behavior (Laird & Zeringue, 2019; Padilla-Walker & Son, 2019). When adolescents openly disclose information, parents have an opportunity to advise adolescents on how to cope with uncertain situations (Chaparro & Grusec, 2015), which strengthens parent-child relationships (Collins & Miller, 1994; Donovan, Thompson, LeFebvre, & Tollison, 2017) and likely improves outcomes for teens. In the current study, associations between adolescent disclosure and outcomes including depression, anxiety, delinquency, and prosocial behavior were examined.

In contrast to the consistent research findings on adolescent disclosure and adolescent depression, delinquency, and prosocial behavior, research findings focused on associations between parental solicitation and these outcome variables are mixed. Parental solicitation has been found to be associated with adolescent outcomes including less depression, anxiety, aggression, and delinquency (Criss et al., 2015; Hamza & Willoughby, 2011; Laird et al., 2010), while other research suggests that parental solicitation is associated with psychologically controlling behaviors (Gaertner, Rathert, Fite, Vitulano, Wynn, & Harber, 2010) and subsequently higher levels of adolescent depression over time (Fernandez et al., 2018). The current study will help clarify the role of in-person and technology-based adolescent disclosure and parental solicitation on adolescent outcomes.

### **Parent-Child Closeness**

Parental solicitation and adolescent disclosure both contribute to the development of close parent-child relationships. Though research has not yet specifically examined associations between adolescent disclosure and parent-child closeness, research findings reveal that adolescents disclose information to those they are closest to (Finkenauer et al., 2008) and that the process of sharing personal information strengthens relationships (Collins & Miller, 1994; Donovan et al., 2017). Therefore, adolescents likely disclose information to and strengthen relationships with parents whom they are already close with. Further, parent-child closeness has been found to be a protective factor against aggressive and delinquent behavior (Zhang, Chen, Zhang, Zhou, & Wi, 2008), and depression (Ge, Natsuaki, Neiderhiser, & Reiss, 2009), and is foundational for the

development of prosocial behavior in adolescence (Eberly & Montemayor, 1999; Padilla-Walker, Nielson, & Day, 2016). Taken together, the current study will assess whether parent-child closeness acts as a mediator between adolescent disclosure and adolescent outcomes, to determine whether adolescent disclosure protects against depression, anxiety, and delinquency, and encourages prosocial behavior because of its relation to parent-child closeness. It is also unclear whether adolescent disclosure is differently related to parent-child closeness depending on the medium (in-person or using technology), these associations were tested as well.

### **Moderating Variables**

**Gender-Dyads and Adolescent Age.** It is possible that the strength of associations between adolescent disclosure in-person and using technology, parent-child closeness, and adolescent outcomes differ based on gender-dyad (e.g., Papini et al., 1990; Steele & McKinney, 2019). Across the existing literature, studies have shown that some aspects of parenting differ based on the gender of parent and child. For example, Luk and colleagues (2010) found that father-son communication was protective against marijuana use while mother-son communication prevented cigarette smoking. Further, Steele and McKinney (2019) reported that the lowest rates of internalizing and externalizing behaviors were associated with high quality relationships in same-sex parent-child dyads (e.g., father-son, mother-daughter). Finally, research findings suggest that a warm parent-child relationship was more closely associated with adolescent disclosure among girls than boys (Yun, Cui, & Blair, 2016).

Associations between adolescent disclosure in-person and using technology and adolescent outcomes may also differ based upon adolescent age, and there are a number of reasons why this may be so. Some research suggests that younger adolescents are more likely to disclose openly to their parents than older adolescents (Papini et al., 1990), and older adolescents are more likely to own their own cell phone (Rideout & Robb, 2019), and therefore have greater ability to disclose using technology than younger adolescents.

### **Purpose and Significance of the Current Study**

Though research has examined associations between adolescent disclosure and adolescent outcomes (e.g., delinquency and prosocial behavior; Padilla-Walker & Son, 2019), there are gaps in our understanding of how adolescent depression, anxiety, delinquency, and prosocial behavior are associated with solicitation and disclosure both in-person and using technology. The current study will make a significant contribution to the field theoretically, in that it is the first to expand the use of the CPM theory (Petronio, 1994) to parents and adolescents using technology to communicate. For example, some adolescents may choose technology to disclose less and more easily hide information from their parents, while others may choose technology to disclose sensitive information they are uncomfortable talking about in-person. This is an important theoretical expansion as it increases our understanding of how and why parents and adolescents communicate in-person and using technology to discuss different topics and lays a foundation for future research to continue examining ways that different types of information can be shared between parents and adolescents.

This study also advances understanding through an examination of the nuances between parent-child conversations in-person and using technology. Indeed, some adolescents may be more comfortable sharing information with their parent using technology rather than in-person, though communicating using technology may not be as effective in creating close parent-child relationships, or as protective against negative outcomes. It may also be that some adolescents do not disclose information to their parent in-person, and conversations using technology are the only way for some parents to gain important information about their child. Finally, this study contributes to the field by examining how discrepancies in parent and child report of parental solicitation are associated with adolescent outcomes. The existing literature on parent and child discrepancies in reports of parental solicitation is limited (e.g., Abar et al., 2015), and further understanding of these differences is needed to understand their impact on adolescent outcomes.

### **Research Questions**

**Research Question 1.** How is adolescent report of parental solicitation in-person and using technology associated with adolescent report of adolescent disclosure in-person and using technology?

**Research Question 2a.** Is adolescent report of adolescent disclosure in-person and using technology differently associated with parent-child closeness?

**Research Question 2b.** Is adolescent report of adolescent disclosure in-person and using technology associated with depression, anxiety, delinquency, and prosocial behavior?

**Research Question 2c.** Does parent-child closeness mediate the relationships between adolescent report of adolescent disclosure (in-person and using technology) and depression, anxiety, delinquency, and prosocial behavior?

**Research Question 2d.** Are the significant associations determined in research question 2b moderated by a single variable for parent-child gender dyad and adolescent age?

**Research Question 3a.** Are there discrepancies in how frequently parents and children report parental solicitation behaviors in-person and using technology?

**Research Question 3b.** Are discrepancies in parent and child report of parental solicitation in-person and using technology associated with parent-child closeness, depression, anxiety, delinquency, and prosocial behavior?

### **Method**

See the method section of study one for a complete description of the sample and procedure used in study two.

### **Measures for Study Two**

Many measures utilized in study two were also used in study one. New measures will be described here.

**Demographic information.** See study one, page 20.

**Adolescent disclosure.** See study one, page 20.

**Parental solicitation.** See study one, page 21.

**Depression.** Child report of adolescent depression was measured using the Center for Epidemiological Studies Depression Scale for Children (CES-DC; Faulstich, Moore,

Carey, & Ruggiero, 1986), which asks adolescents to rate “how much they have felt this way during the past week” using three items on a 4-point Likert scale from 1 (*not a lot*) to 4 (*a lot*). Questions included, “I felt down and unhappy,” “I wasn’t able to feel happy, even when my family and friends tried to make me feel better,” and “It was hard to get started doing things.” Items were summed ( $M = 5.47$ ,  $SD = 2.63$ ;  $\alpha = .88$ ).

**Anxiety.** Child report of adolescent anxiety was measured using The Spence Child Anxiety Scale (SCAS; Spence, 1998). Adolescents rated “how often they experience” three items on a 4-point Likert scale from 1 (*not a lot*) to 4 (*a lot*). Questions included, “I worry about things,” “When I have a problem, my heart beats really fast,” and “I worry that something bad will happen to me.” The items were summed ( $M = 6.57$ ,  $SD = 2.65$ ;  $\alpha = .84$ ).

**Prosocial behavior.** Child report of prosocial behavior toward family was assessed using an adapted version of the Kindness/Generosity Subscale (Peterson & Seligman, 2004). The scale contains three items, and adolescent participants reported how often they did each on a 5-point Likert scale from 1 (*never*) to 5 (*very often*). Questions included, “I help my family, even if it’s not easy for me,” “I do small favors for my family,” and “I voluntarily help my family (with chores or watching a sibling).” The items were summed ( $M = 11.88$ ,  $SD = 2.49$ ;  $\alpha = .84$ ).

**Delinquency.** Child report of adolescent delinquency was measured using a scale (Barber, Stolz, Olsen, & Maughan, 2005) originally adapted from the Child Behavior Checklist (Achenbach, 1991). Adolescents were asked to report how true nine items were of them during the past six months, on a 3-point Likert scale from 0 (*not true*) to 3 (*often*

*true*). Sample questions include, “I lie or cheat,” “I steal from places other than home,” and “I use alcohol or drugs.” The items were summed ( $M = 12.25$ ,  $SD = 4.42$ ;  $\alpha = .91$ ).

**Parent-child closeness.** Adolescent report of parent-child closeness was measured using the Parental Closeness Measure (Armsden & Greenberg 1987; Darling & Toyokawa, 1997), including 10 items on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Adolescents were specifically asked to report on the parent also participating in the study. Sample questions include, “I am satisfied with my relationship with my mother/father,” and “I feel that I can talk to my mother/father about almost anything.” Items were combined using a mean score ( $M = 4.42$ ,  $SD = .60$ ;  $\alpha = .91$ ).

### **Data Analysis Plan**

To test the first research question, path analysis in MPlus (v.8.1) was utilized to examine associations between adolescent report of parental solicitation in-person and using technology, and adolescent disclosure in-person and using technology (see Figure 1, solid squares and lines). To answer research questions 2a-2c, a path analysis was constructed to examine associations between adolescent disclosure in-person and using technology, and depression, anxiety, delinquency, and prosocial behavior. Parent-child closeness was examined as a manifest mediator using the INDIRECT command in MPlus, and indirect effects were computed using 2000 bootstraps (research question 2c). In the current study, path analysis models were evaluated based on model fit, parsimony, and interpretability (Collins & Lanza, 2010), following the same model fit standards described in study one. For all research questions, control variables were selected based on significant correlations, t-tests, and ANOVA analyses between main study variables

(parental solicitation, adolescent disclosure, parent-child closeness, depression, anxiety, delinquency, and prosocial behavior) and demographic variables (see Table 9).

Significant mean differences were found for parental solicitation and adolescent disclosure using technology based on parent gender and employment status, and significant correlations existed between solicitation and disclosure in-person and adolescent age. Accordingly, parent gender, child gender, employment status, and adolescent age were included as covariates in each study two model.

For research question 2d, preliminary analyses were conducted to determine whether the model described above should be moderated by parent-child gender dyad and adolescent age. First, a single variable including six parent-child gender dyad groups was created based on parent and child gender (e.g., mother-daughter, mother-son, mother-transgender/nonbinary child, etc.). The two groups containing transgender/nonbinary participants were too small to examine group differences, and these dyads were removed for this analysis. An ANOVA was computed to determine whether there were differences in outcome variables based on the variable created for parent-child gender dyad. Results of the ANOVA suggested that no group differences existed based on parent-child gender dyad for any study variables. Correlations were analyzed to understand whether adolescent age was significantly associated with outcome variables, and no significant correlations were found. Thus, moderation analyses were not conducted for parent-child gender dyad and adolescent age.

To answer research question 3a, a paired samples t-test was conducted using IBM SPSS (v.22.0) to determine whether differences in parent and adolescent report of

parental solicitation in-person and using technology exist. Difference scores were computed between parent and adolescent report of solicitation by subtracting child report of parental solicitation in-person from parent report of parental solicitation in-person (M of discrepancy variable =  $-.11$ ,  $SD = .87$ ), and child report of parental solicitation using technology from parent report of parental solicitation using technology (M of discrepancy variable =  $.14$ ,  $SD = .98$ ). Three groups were created for discrepancies in parental solicitation (e.g., no difference between parent/child, parent reporting more solicitation, child reporting more solicitation), separately for solicitation in-person and using technology. Next, an ANOVA was conducted to determine whether differences in outcome variables existed based on discrepancy group membership (e.g., no difference between parent/child, parent reporting more solicitation, child reporting more solicitation). Results of the ANOVA suggested that no significant differences existed for any outcome variable based on discrepancy group. The absolute value for the difference scores were then taken so that higher discrepancy scores designated greater differences between parent and child report of parental solicitation (regardless of who reported more or less solicitation). Finally, a path analysis in SEM was conducted with the absolute value difference score variables for parental solicitation in-person and using technology as exogenous manifest variables, and manifest endogenous variables including depression, anxiety, delinquency, prosocial behavior, and parent-child closeness (see Figure 1, solid squares and lines). The same model fit standards described in study one and for research questions 1 and 2a-2c in study two were also used to evaluate this path analysis model.

## Results

### Research Question 1

To answer the first research question, a path analysis was constructed in MPlus (v.8.1) to examine associations between adolescent report of parental solicitation in-person and using technology, and adolescent disclosure to parents both in-person and using technology (see Figure 4). Control variables were selected based on significant correlations, t-tests, and ANOVA's between main study variables, and included parent gender, child gender, employment status, and adolescent age. The model was fully saturated, and the overall model could not be evaluated; only coefficients are reported. Adolescent report of parental solicitation in-person was positively associated with adolescent disclosure in-person ( $\beta = .73, p < .001$ ) and using technology ( $\beta = -.06, p = .045$ ). Additionally, adolescent report of parental solicitation using technology was positively associated with adolescent disclosure using technology ( $\beta = .86, p < .001$ ). Effect sizes were moderate in strength, see Table 10.

### Research Question 2

A path analysis was conducted in Mplus (v.8.1) examining associations between adolescent disclosure in-person and using technology, and depression, anxiety, delinquency, and prosocial behavior, mediated by parent-child closeness (see Figure 5). Control variables included parent gender, child gender, adolescent age, and parent employment status. Model fit for the path analysis was acceptable, ( $\chi^2(4) = 4.604, p = .453, RMSEA = .02, CFI = .99$ ). Results of the path analysis suggest that adolescent disclosure in-person was positively associated with prosocial behavior ( $\beta = .29, p <$

.001), and not significantly associated with depression, anxiety, or delinquency. However, adolescent disclosure using technology was positively associated with depression ( $\beta = .24, p < .001$ ), delinquency ( $\beta = .21, p < .001$ ), and anxiety ( $\beta = .21, p < .001$ ), and not significantly associated with prosocial behavior. Additionally, adolescent disclosure in-person was positively associated with parent-child closeness ( $\beta = .71, p < .001$ ), while adolescent disclosure using technology was not directly associated with parent-child closeness. Parent-child closeness was negatively associated with depression ( $\beta = -.27, p < .001$ ), delinquency ( $\beta = -.15, p = .034$ ), and anxiety ( $\beta = -.15, p = .028$ ) and positively associated with prosocial behavior ( $\beta = .20, p = .001$ ). Effect sizes were very small to moderate in strength, see Table 11.

Mediation analyses revealed that parent-child closeness fully mediated the relationships between adolescent disclosure in-person, and depression ( $\beta = -.19, p < .001$ ), anxiety ( $\beta = -.11, p = .037$ ), and delinquency ( $\beta = -.11, p = .006$ ), and partially mediated the relationship between adolescent disclosure in-person and prosocial behavior ( $\beta = .14, p = .009$ ). There were no significant indirect effects for adolescent disclosure using technology (See Figure 5).

In order to determine whether moderation analyses based on a single variable computed for parent-child gender dyad and adolescent age should be conducted, preliminary analyses were computed in IBM SPSS (v.22.0). Results of an ANOVA indicated that no group differences existed based on parent-child gender dyad for any outcome variable. In addition, there were no significant correlations between adolescent

age and study variables (see Table 9), so the moderation analyses for parent-child gender dyad and adolescent age were not conducted.

### **Research Question 3**

A paired samples t-test was conducted to determine whether there were differences between parent and child report of parental solicitation in-person and using technology. Results suggest that parents reported less frequent parental solicitation in-person ( $M = 3.67$ ) than their child ( $M = 3.78$ ;  $t(402) = -2.49, p = .013$ ). Conversely, parents ( $M = 3.05$ ) reported more frequent parental solicitation using technology than their child ( $M = 2.90$ ;  $t(401) = 2.96, p = .003$ ).

To answer research question 3b, absolute value discrepancy variables for parental solicitation in-person and using technology were used as exogenous manifest variables in a path analysis conducted in MPlus (v.8.1). Absolute value variables were used because there were no significant differences in main study variables based on whether the parent or adolescent reported higher levels of solicitation in-person and using technology. Control variables included parent gender, child gender, adolescent age, and parent employment status. Associations between the absolute value discrepancy variables for parental solicitation in-person and using technology, and adolescent report of parent-child closeness, depression, anxiety, delinquency, and prosocial behavior, were examined in this model. The model was fully saturated and the overall model could not be evaluated; only coefficients are reported (see Figure 6). Results suggest that greater discrepancies between parent and child report of parental solicitation in-person were negatively

associated with prosocial behavior ( $\beta = -.19, p < .001$ ) and parent-child closeness ( $\beta = -.22, p < .001$ ). Effect sizes were small in strength, see Table 12.

## **Discussion**

The CPM theory (Petronio, 1991) lays an important foundation for understanding how and why adolescents choose to disclose information to their parents and increases our understanding of how adolescents might perceive parental attempts at solicitation. The findings of the current study contribute to understanding how parental solicitation (including discrepancies between parent and child report of parental solicitation) and adolescent disclosure in-person and using technology relate to adolescent outcomes and parent-child relationships. Additionally, the findings of the current study advance understanding of potential mental health concerns for youth that may exist when parents and adolescents are not on the same page.

### **Communication In-Person Versus Using Technology**

Technology use among parents and adolescents is salient (Lauricella et al., 2016; Rideout & Robb, 2019), and both parents and adolescents report communicating with each other using technology (Rudi et al., 2015). However, little research has examined the implications of such communication. The findings of the current study suggest that there are differences in adolescent outcomes and parent-child closeness based on whether communication occurs in-person or using technology.

**Adolescent outcomes.** Adolescent disclosure in-person was positively associated with prosocial behavior, while disclosure using technology was positively associated with depression, anxiety, and delinquency. Research suggests that communication patterns in

families have changed with the rise of technology use (Storch, Ortiz, & Juarez-Paz, 2018) and it is important that parents and adolescents maintain balance in how frequently technology is chosen for communication, as potential negative implications exist when communicating using technology.

There are a number of factors specific to development in adolescence that may impact how communication using technology is associated with depression, anxiety, delinquency, and prosocial behavior. Establishing autonomy from parents is a key developmental task in adolescence (Zimmer-Gembeck & Collins, 2008) and the ability to filter information from parents is an important part of developing autonomy (Petronio, 2004). Adolescents who are already sensitive to their developing autonomy (Zimmer-Gembeck & Collins, 2008) may create boundaries to protect their private information from their parents (Petronio, 2004) by filtering information, keeping secrets, and withholding information (Finkenauer et al., 2008). Some research indicates that filtering or withholding information is easier when communicating via text messaging, as compared to face-to-face communication (Craig, Perez, & Gatesman, 2016), and in fact, communication using technology is generally conducive to secret keeping (e.g., Birnholtz, Guillory, Hancock, & Bazarova, 2010). However, previous research findings have indicated that keeping secrets from parents is associated with depression, stress, aggressive behavior, and delinquency among adolescents, as well as decreased self-esteem and self-control (Dykstra, Willoughby, & Evans, 2020; Finkenauer, Engels, & Meeus, 2002; Frijns, Finkenauer, Vermulst, & Engels, 2005). As such, adolescents may choose to communicate using technology in order to filter information and establish

autonomy from parents, but doing so may be linked with depression, anxiety, and delinquent behavior.

It is also possible that associations between adolescent disclosure using technology and depression, anxiety, and delinquency are bidirectional. To illustrate, research findings suggest that adolescent delinquency was associated with less disclosure in-person (Keijsers, Branje, VanderValk, & Meeus, 2010), and that depression (Caplan, 2003) and loneliness (Leung, 2011) were predictive of frequent communication using technology. In this way, adolescents who experience depression and anxiety, or those who engage in delinquent behavior may choose to disclose information more frequently using technology in order to withhold information from parents about depressive or anxious feelings and delinquent acts. It may also be that depressed or anxious individuals more frequently socially isolate themselves from others, spending more time online as a result (Nelson, Coyne, Howard, & Clifford, 2016).

**Parent-child closeness.** In the current study, adolescent disclosure in-person was associated with parent-child closeness. Existing research suggests that bonding occurs deeply and quickly when communication occurs in-person (Sherman et al., 2013) based on the ability to read facial expressions, recognize tone of voice (Burgoon et al., 2016; Mehrabian, 2017), and engage in physical touch (Schroeder et al., 2019). As such, it is likely that when adolescents and parents communicate in-person, individuals experience positive outcomes including a close parent-child relationship. This relationship may also be bidirectional. Adolescents disclose more information to parents in the context of a warm (Laird & Zeringue, 2019), autonomy supportive (Jiménez -Iglesias, Moreno,

Garcia-Moya, & Ramos, 2013), and validating (Martin, Kim, & Freyd, 2018) relationship. Thus, adolescents may be more willing to share information and include their parent inside their privacy boundary when a positive relationship already exists, further strengthening the parent-child relationship when personal information is shared (Collins & Miller, 1994; Donovan et al., 2017).

On the other hand, adolescent disclosure using technology was not associated with parent-child closeness. Some research suggests that communication via technology may be linked with negative outcomes, including misinterpretations in meaning and unnecessary conflict (Hertlein & Ancheta, 2014), and that family members feel less connected when communicating using technology (Johnson, 2017). However, the findings of the current study do not indicate that adolescent disclosure using technology is negatively associated with parent-child closeness. Indeed, parents and children may experience greater closeness when communication occurs in-person, but disclosure using technology was not significantly associated with parent-child closeness.

Finally, parent-child closeness fully mediated associations between adolescent disclosure in-person and depression, anxiety, and delinquency. In this way, disclosure in-person was positively linked with parent-child closeness, and parent-child closeness was negatively associated with depression, anxiety, and delinquency. Previous research findings indicate that adolescent disclosure is an important factor in preventing against negative outcomes in adolescence (Padilla-Walker et al., 2018). However, these findings suggest that parent-child closeness plays an important role in the protective nature of adolescent disclosure. That is, the relationship developed between parent and child

through the process of adolescent disclosure may be key in preventing against negative outcomes in adolescence. This finding also highlights the importance of parent-child communication occurring in-person, as the protective nature of adolescent disclosure and parent-child closeness on adolescent outcomes was only evident for adolescent disclosure in-person. Communication via technology is a convenient way to quickly convey information between individuals and may play an important role in maintaining parent-child relationships when individuals are physically distant. However, only adolescent disclosure in-person was significantly associated with parent-child closeness and as such, parents and adolescents must balance how frequently communication occurs via technology so that it complements but does not replace in-person disclosure.

#### **Discrepancies Between Parent and Child Report of Parental Solicitation**

The findings of the current study suggest that parents and adolescents have varying perceptions of the frequency of parental solicitation behaviors, evidenced by discrepancies in parent and child report of parental solicitation in-person and using technology. Specifically, parents reported engaging in parental solicitation in-person less frequently than adolescents reported. Additionally, parents reported more frequent solicitation using technology than adolescents reported. First, it is interesting that parents reported higher levels of solicitation using technology than adolescents, especially given that within the current study 55% of parents reported (at least occasionally) feeling that the only way to communicate with their adolescent was using technology. Perhaps parents are soliciting more frequently using technology because they believe it is the best or only way to communicate with their child. On the other hand, parents report engaging

in less solicitation in-person than adolescents report for them. Previous research findings suggest that adolescents seek increased autonomy (Wray-Lake et al., 2010), and that discrepancies in parent and child reports of parenting behaviors may be a healthy and natural indicator of separation from parents (Ohannessian, Lerner, Lerner, & von Eye, 2000). It may be that parents recognize their child's desire for increased autonomy in adolescence and solicit less information in-person. However, adolescents may perceive parental solicitation as an obstruction of autonomy (Hawk et al., 2009), and may report that their parent solicits information more frequently as a result.

Discrepancies in parent and adolescent report of parental solicitation behaviors may also occur due to differing perceptions and definitions of parental solicitation (Guion et al., 2019). For example, a parent may believe they are engaging in parental solicitation when they ask their child to send them a text message when arriving at a location, while an adolescent may not consider this a form of parental solicitation. In addition, a parent may engage in a conversation with their child in-person after school without intending to solicit, while the child may perceive that their parent is soliciting information.

In the current study, discrepancies between parent and child report of parental solicitation in-person were negatively associated with parent-child closeness and prosocial behavior. According to these findings, disagreements about frequency of in-person communication may be problematic for the parent-child relationship because adolescents who feel their parent is frequently soliciting private information may perceive that their privacy and autonomy are not respected (Hawk et al., 2009; Petronio, 1994). Moreover, it is interesting that discrepancies in parental solicitation using

technology were not significantly associated with any outcome. Some adolescents report that parent-child conversations using technology are often unnecessary, and that most information shared via technology could be more easily shared in-person (Lachance, 2020). Perhaps discrepancies in parent and adolescent reports of parental solicitation using technology are not impactful to parent-child closeness and adolescent outcomes because conversations via technology are more routine than private in nature, while disagreeing on in-person communication is impactful to a relationship because in-person conversations are more intimate. For example, parents and adolescents may communicate about location or scheduling or while using technology, while intimate details about adolescent thoughts, feelings, or behaviors may be shared in-person.

### **Limitations and Future Directions**

Many limitations in the current study mirror those detailed in study one, including the cross-sectional, self-report (with the exception of parental solicitation and adolescent disclosure), and online nature of the data. It is important for future research to examine these associations longitudinally in order to determine directionality, and to measure both parent and adolescent report of depression, anxiety, delinquency, and prosocial behavior to limit social desirability (Van de Mortel, 2008) and recall bias common in self-report data (Althubaiti, 2016).

Next, the measure for adolescent disclosure utilized a combined measure of two scales including items focused on routine (e.g., whereabouts, activities, school) and self-disclosure (e.g., secrets, private feelings). Due to multicollinearity, the scales could not be examined separately, though it is likely that differences in parent-child closeness and

adolescent outcomes exist based on the type of information disclosed. Previous research findings support this notion, as parent-child closeness differed based on which type of information adolescents shared over text messaging (Warren & Aloia, 2018). To illustrate, texting to schedule and make plans was not associated with parent-child closeness, while texting to express support or resolve conflict was linked with greater feelings of closeness (Warren & Aloia, 2018). Future research should examine differences in adolescent outcomes and parent-child closeness based on the types of information disclosed in-person and using technology, to better understand in which situations communication in-person and using technology are most appropriate.

Finally, in the current study differences in outcomes based on whether adolescent disclosure occurs in-person or using technology were examined, though it is likely that parents and adolescents are communicating using both mediums. Indeed, multiple methods (in-person or using technology) may be used for communication surrounding one specific topic or event. For instance, an adolescent may text their parent from school about a difficulty they are experiencing with a teacher or a friend. Though the adolescent may benefit from the ability to conveniently and quickly communicate with their parent via technology, meaning can be lost and the parent may misinterpret their emotion (Hertlein & Ancheta, 2014). Upon arriving home, the parent and adolescent may continue discussing the situation in-person where they can interact with both verbal (e.g., words, tone of voice), and nonverbal (e.g., facial expression, physical touch) forms of communication, in order to reach a comprehensive understanding of how the adolescent is feeling. Problems that may arise when communication occurs using technology were

not examined in the current study, nor was how frequently conversations on one topic occur both in-person and using technology. These associations should be examined in future research to better understand how using technology as a complement to in-person conversation impacts parent-child relationships and adolescent outcomes.

### **Conclusion**

The current study contributes to the existing literature by providing evidence that there are inherent differences in the role of parent-child communication in-person and using technology, with potential negative implications existing for communication using technology. It is important for parents and adolescents to use technology to complement (but not replace) communication in-person to facilitate strong parent-child relationships and prevent against negative outcomes. Future research should continue examining the prevalence and effects of parent-child communication in-person and using technology in order to understand in which contexts communication in-person or using technology is warranted.

### **Integrated Discussion and Conclusions**

Together, these studies provide evidence that parental solicitation and adolescent disclosure are important aspects of parent-child communication, and that parents and adolescents specifically choose to communicate in-person or using technology depending on their individual communication needs. The findings of both studies connect and integrate (see Figure 1) by describing why individuals choose to communicate in-person or using technology, and what impacts those decisions (associations examined in study one). Without understanding the associations examined in study one, we cannot fully

comprehend why differences in the outcomes associated with solicitation and disclosure in-person and using technology (examined in study two) are salient. It is important to consider the findings of both studies together, in order to obtain a complete picture of how and why parent-child communication occurs both in-person and using technology, and how the medium used for communication is associated with parent-child and adolescent outcomes.

In addition, understanding why individuals choose to communicate in-person or using technology may promote behavioral changes. For example, if a parent knows that their adolescent is choosing technology to communicate about sexual behavior because they are uncomfortable discussing the topic in-person, the parent can ensure that they are open-minded and nurturing during conversations using either medium to help the adolescent feel more comfortable. Further, knowing why individuals choose to communicate in-person or using technology, and the adolescent outcomes (e.g., depression, anxiety, delinquency, prosocial behavior) associated with those decisions, can provide evidence and motivation for parents and adolescents to communicate in the most appropriate manner depending on the topic or type of conversation they are seeking.

### **Implications for Parents and Practitioners**

There are a number of implications for parents and practitioners based on the findings of these studies. First, it is important for parents and adolescents to be purposeful when selecting whether to communicate in-person or using technology. The findings of study two indicate that adolescent outcomes differ based on whether communication occurs in-person or using technology, and that choosing technology for parent-child

communication can be problematic in some circumstances. For example, communication using technology was positively associated with depression, anxiety, and delinquency, and negatively associated with prosocial behavior and parent-child closeness. Conversely, communication in-person was not directly associated with depression, anxiety, or delinquency, but was negatively associated with these outcomes through parent-child closeness. Though technology provides a convenient and effective way to quickly communicate, there are some features of in-person conversation (e.g., facial expression, tone of voice) that cannot be replicated using technology. These findings do not suggest that parents and adolescents should stop communicating using technology, but rather that parents and adolescents should carefully choose a medium for communication based on the topic and goal of each individual conversation. Practitioners working with parents and adolescents should recommend caution in selecting technology for important parent-child conversations, as some communication using technology has been linked with depression, anxiety, and delinquency.

The results of the studies also suggest that parents and adolescents mirror one another when selecting a medium for communication. For example, parental solicitation in-person or using technology was associated with adolescent disclosure in-person or using technology, respectively. In the current sample, 55% of parents reported communicating using technology because they felt (at least occasionally) that it was the only way to communicate with their adolescent. However, the results indicate that if a parent desires more frequent in-person communication with their adolescent, they should avoid repeated communication using technology and choose to communicate in-person

often. In addition, it is possible that adolescents wish to communicate with their parent in-person but feel that their parent more frequently communicates and responds using technology. Practitioners should encourage both parents and adolescents to most often communicate in-person, and to use technology to complement face-to-face conversation, in an effort to establish healthy patterns for parent-child communication.

Parent-child closeness emerged as an essential protective factor against negative outcomes in adolescence. Indeed, when parents and adolescents communicate in ways that strengthen parent-child closeness, adolescents are protected against depression, anxiety, and delinquency. Since communication in-person was associated with parent-child closeness, but conversations using technology did not contribute to parent-child closeness, parents and adolescents should seek to communicate in ways that strengthen their relationship (i.e., in-person). In addition, parents can focus on specific, *enactable* strategies to positively impact their adolescent's development, such as spending quality time together, thereby increasing in-person communication and subsequent relationship closeness.

Finally, the dynamic within every parent-child relationship is unique, so it is important for parents and adolescents to work together to find communication strategies that work best for individual relationships. In the current studies, parents and adolescents differed in how frequently they chose to communicate using technology to satisfy communication needs, with adolescents choosing technology more frequently than parents. In addition, most parent-child dyads reported discrepancies in how frequently parents and adolescents reported parental solicitation occurring in-person and using

technology. Some variability may be due to generational differences in technology use, with adolescents being digital natives and parents being digital immigrants (Prensky, 2001). Regardless, it is important that parents and adolescents establish effective communication patterns and then satisfy communication needs using whichever method of communication is most effective for the type and topic of conversation. In most parent-child relationships, this will include a unique combination of communication both in-person and using technology. For example, one parent-child dyad might effectively communicate using technology when scheduling and making plans, while conversations regarding homework and grades are more productive in-person. Another parent-child dyad may communicate about school using technology with ease, while conversations regarding activities and relationships with friends might function better in-person. Practitioners should encourage parents and adolescents to openly discuss communication patterns within their relationships to most effectively satisfy the communication needs of both individuals.

### **Limitations and Future Directions**

These studies contribute to the overall literature by providing understanding of how and why parental solicitation and adolescent disclosure occur in-person or using technology, and the outcomes associated with each. The current studies focused specifically on how communication needs can be satisfied; however, there are a number of other factors that might influence whether individuals choose to communicate in-person or using technology, or using a combination of the two. First, it is important to understand how several individual characteristics (e.g., sociability, mental health) are

associated with how people choose to communicate. For example, individuals with socially avoidant personalities engage in more technology use (Nelson et al., 2016), which may translate to more frequent parent-child communication using technology as well. In addition, mental health, including depression and anxiety has been associated with poor parent-child communication patterns (e.g., less openness to communication; De Luca, Yueqi, DiCorcia, & Padilla, 2018). It may be that depressed or anxious individuals turn to technology for communication more frequently because they feel more able to keep feelings and emotions private by communicating in this manner.

It may also be that parents and children specifically choose to communicate in-person or using technology based on the closeness of the parent-child relationship. For example, an adolescent who does not feel close to their parent may be less likely to disclose emotional or relational information in-person and may choose to briefly communicate information using technology instead. Conversely, parents who feel close to their adolescent child may be more comfortable soliciting personal information in-person than a parent who does not have a strong relationship with their child. It is also possible that technology is simply used for the purpose of connecting when parents and children are not together, and that communication from a distance occurs more frequently in the context of a close parent-child relationship. Future research should examine these associations, with a particular focus on qualitative or mixed methods research to discover *why* parents and adolescents choose to communicate in-person or using technology and how parent-child closeness relates to those decisions.

Next, in the current studies, communication using technology was examined in general, without specifying which form of technology parents and adolescents most often chose to communicate. However, it is likely that parent-child communication using some forms of technology may be more closely related to parent-child closeness than others. For example, communicating via phone calls or video chat may be more advantageous for parent-child closeness because of the ability individuals have to hear tone of voice or see facial expressions, while text messaging or passive communication via social media (e.g., lurking or viewing the child's profile online) may serve a different but important purpose. For example, social media or text messaging may allow parents and adolescents to share general information that provides content for an in-person discussion later, or to simply check in while physically distant. These forms of technology may be less closely related to parent-child closeness because of the nature of the conversations that occur using these specific forms of technology. Future researchers should focus on differences in varying forms of technology in relation to parent-child closeness and adolescent outcomes in order to understand which types of technology are most likely to benefit both parents and children.

Finally, it is important to recognize that there are differences in the availability of technology based on a number of factors including socioeconomic status (Harris, Straker, & Pollock, 2017), or regulations of internet or technology use based on location (e.g., China regulates internet and technology use more than the United States or countries in Europe; Xu & Albert, 2017), among others. Having limited access to technology is likely associated with how parent-child communication occurs in-person and using technology,

and the outcomes associated with communicating using each medium. For example, a parent-child dyad living in a country with government regulated internet use may communicate in-person to satisfy communication needs that individuals with unregulated access to technology satisfy through the use of technology. It is important for future research to examine how and why parents and children choose to communicate in-person and using technology, and the outcomes of such use in various countries in order to understand how parents and adolescents communicate differently based on these factors.

### **Conclusion**

The current studies fill gaps in the existing literature by providing understanding of *why* individuals choose to communicate in-person and using technology, and how parental solicitation and adolescent disclosure using each medium relates to adolescent outcomes. Effective parent-child communication, including communication that strengthens parent-child relationships is essential for protecting against negative outcomes in adolescence. It is important for parents and practitioners to understand the specific needs that are satisfied through communication in-person and using technology, and the outcomes relating to each, in order to make informed decisions on when and why to communicate through each medium. Parents and adolescents should be purposeful in selecting whether to communicate in-person or using technology based on the specific communication needs they aim to have satisfied in each conversation.

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Table 1: Median factor loadings for the adolescent disclosure scale

Content	Factor Loading	
	In-person	Using technology
How often do you tell your parent how you are doing in different subjects in school?	0.61	0.78
How often do you initiate a conversation with your parent about school (relationships with others, teachers, assignments)?	0.58	0.78
If you are out at night, do you tell your parent what you have done that evening?	0.60	0.73
How much do you share secrets or private feelings with your parent?	0.78	0.87
How often do you turn to your parent for support with personal problems?	0.85	0.92
How much do you tell your parent everything?	0.85	0.90
How much do you depend on your parent for help, advice, or sympathy?	0.74	0.87
How much do you talk to your parent about things you don't want others to know?	0.84	0.90
When you are feeling down or upset, how often do you depend on your parent to cheer things up?	0.76	0.90

Table 2: Correlations and descriptive statistics for all study one variables

<i>Parent Variables</i>	1.	2.	3.	4.	5.	6.	7.
1. Technology to satisfy needs	-						
2. Disclosure IP	-0.05	-					
3. Disclosure T	0.30***	0.08	-				
4. Solicit IP	0.13	0.39***	0.28***	-			
5. Solicit T	0.38***	0.12	0.62***	0.57***	-		
6. Age	-0.21***	-0.02	-0.13	-0.09	-0.19***	-	
<i>Child Variables</i>							
7. Technology to satisfy needs	0.52***	0.04	0.21***	0.03	0.15**	-0.15***	-
8. Disclosure IP	0.07	0.33***	0.21	0.32***	0.26***	-0.13	0.10
9. Disclosure T	0.40***	0.06	0.52***	0.27***	0.59***	-0.21***	0.38***
10. Solicit IP	0.13	0.28***	0.23***	0.47***	0.36***	-0.12	0.08
11. Solicit T	0.41***	0.05	0.47***	0.34***	0.63***	-0.21***	0.31***
12. Age	-0.05	-0.15***	0.04	-0.12	-0.06	0.28***	-0.02
Mean	4.17	4.47	3.76	3.67	3.05	43.37	4.55
SD	1.03	0.59	1.01	0.89	1.13	8.78	1.08
Range	1-6	2-5	1-5	1-5	1-5	26-76	1-6

Table 2 Continued

	8.	9.	10.	11.	12.
8. Disclosure IP	-				
9. Disclosure T	0.38***	-			
10. Solicit IP	0.71***	0.38***	-		
11 Solicit T	0.33***	0.84***	.52***	-	
12. Age	-0.12	-0.02	-0.16***	-0.05	-
Mean	4.05	3.11	3.78	2.90	15.32
SD	0.76	1.15	0.08	1.16	1.47
Range	1-5	1-5	1-5	1-5	13-18

Note: IP = In-person, T = Using technology; Correlations were adjusted using the Bonferroni correction to reduce Type 1 error. The p-value needed to reach significance was \*\*\* $p=.004$  or less.

Table 3: Mean differences in main study one variables by parent gender

	Father (n=153)		Mother (n=250)		<i>t</i> (401)
	M	SD	M	SD	
<b>Parent variables</b>					
Technology to satisfy needs	4.28	0.98	4.10	1.06	1.67
Disclosure IP	4.40	0.61	4.51	0.57	-1.91
Disclosure T	3.89	0.94	3.68	1.05	2.09*
Solicit IP	3.66	0.89	3.67	0.88	-0.19
Solicit T	3.22	1.07	2.94	1.15	2.46*
<b>Child Variables</b>					
Technology to satisfy needs	4.58	1.03	4.54	1.11	0.43
Disclosure IP	4.04	0.68	4.06	0.80	-0.23
Disclosure T	3.32	1.09	2.99	1.18	2.82**
Solicit IP	3.81	0.73	3.76	0.85	0.64
Solicit T	3.06	1.19	2.80	1.14	2.22*

Note: IP = In-person, T = Using technology; \* $p < .05$ , \*\* $p < .01$

Table 4: Mean differences in study one variables by child gender

	Male (n=204)		Female (n=195)		<i>t</i> (397)
	M	SD	M	SD	
<b>Parent Variables</b>					
Technology to satisfy needs	4.14	1.09	4.20	0.98	-0.55
Disclosure IP	4.42	0.62	4.51	0.55	-1.57
Disclosure T	3.62	1.02	3.89	0.98	-2.64**
Solicit IP	3.64	0.92	3.70	0.85	-0.64
Solicit T	2.97	1.16	3.12	1.10	-1.33
<b>Child Variables</b>					
Technology to satisfy needs	4.49	1.09	4.61	1.07	-1.15
Disclosure IP	4.01	0.73	4.10	0.79	-1.17
Disclosure T	3.09	1.10	3.16	1.21	-0.58
Solicit IP	3.77	0.79	3.79	0.82	-0.27
Solicit T	2.88	1.16	2.94	1.17	-0.57

Note: IP = In-person, T = Using technology; Transgender and non-binary participants ( $n = 4$ ) were excluded for these analyses; \*\* $p < .01$ .

Table 5: Mean differences in study one variables by whether parents and adolescents live together full or part-time

	Full-time (n=374)		Part-time (n=22)		t(394)
	M	SD	M	SD	
<b>Parent Variables</b>					
Technology to satisfy needs	4.17	1.04	4.03	0.74	0.61
Disclosure IP	4.49	0.57	4.14	0.74	2.22*
Disclosure T	3.74	1.03	3.98	0.68	-0.26
Solicit IP	3.70	.87	3.26	1.06	2.29*
Solicit T	3.03	1.13	3.12	1.12	-0.25
<b>Child Variables</b>					
Technology to satisfy needs	4.54	1.10	4.69	0.83	-0.63
Disclosure IP	4.00	0.85	4.04	0.70	-0.23
Disclosure T	3.00	1.23	3.42	1.32	-1.57
Solicit IP	3.78	0.81	3.67	0.77	0.62
Solicit T	2.85	1.16	3.29	1.13	-1.71

Note: IP = In-person, T = Using technology; Participants ( $n = 5$ ) who reported not living with their parent at all were excluded for these analyses; \* $p < .05$

Table 6: Mean differences in study one variables by parent education level

	Less than high school (n=19)		High school education (n=91)		Some college (n=144)		College graduate (n=93)		Post-graduate work (n=48)		<i>F</i>
	M	SD	M	SD	M	SD	M	SD	M	SD	
<b>Parent Variables</b>											
Technology to satisfy needs	4.16	1.07	4.17	0.95	4.16	0.93	4.11	1.18	4.40	1.13	0.64
Disclosure IP	4.51	0.60	4.44	0.61	4.45	0.58	4.51	0.61	4.45	0.54	0.25
Disclosure T	4.17	0.79	3.73	1.05	3.69	1.03	3.83	0.96	3.77	1.06	1.11
Solicit IP	3.98 <sub>ab</sub>	0.78	3.59 <sub>ab</sub>	0.97	3.56 <sub>a</sub>	0.83	3.68 <sub>ab</sub>	0.92	4.00 <sub>b</sub>	0.81	2.94*
Solicit T	3.32 <sub>ab</sub>	1.12	2.98 <sub>a</sub>	1.16	2.86 <sub>a</sub>	1.09	3.11 <sub>ab</sub>	1.14	3.55 <sub>b</sub>	1.03	3.91**
<b>Child Variables</b>											
Technology to satisfy needs	4.71	0.95	4.53	0.99	4.56	1.11	4.54	1.12	4.66	1.01	0.23
Disclosure IP	4.00	0.74	3.92	0.80	4.02	0.88	4.03	0.83	4.06	0.84	0.32
Disclosure T	3.39	1.28	2.89	1.23	3.01	1.21	3.00	1.24	3.45	1.13	2.17
Solicit IP	3.74	0.76	3.74	0.82	3.74	0.79	3.84	0.80	3.92	0.78	0.65
Solicit T	3.16 <sub>ab</sub>	1.00	2.72 <sub>a</sub>	1.16	2.85 <sub>ab</sub>	1.17	2.91 <sub>ab</sub>	1.16	3.33 <sub>b</sub>	1.14	2.54*

Note: IP = In-person, T = Using technology; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Subscripts indicate significant differences identified by Bonferroni poc-hoc analyses

Table 7: Mean differences in study one variables by parent work status

	Full-time (n=220)		Part-time (n=56)		Not at all (n=119)		<i>F</i>
	M	SD	M	SD	M	SD	
<b>Parent Variables</b>							
Technology to satisfy needs	4.31 <sub>a</sub>	0.95	4.26 <sub>ab</sub>	0.98	3.91 <sub>b</sub>	1.14	6.15**
Disclosure IP	4.38 <sub>a</sub>	0.63	4.65 <sub>b</sub>	0.41	4.54 <sub>b</sub>	0.55	6.44**
Disclosure T	3.90 <sub>a</sub>	0.91	3.64 <sub>ab</sub>	1.06	3.57 <sub>b</sub>	1.13	4.53*
Solicit IP	3.74	0.85	3.72	0.97	3.52	0.91	2.54
Solicit T	3.25 <sub>a</sub>	1.09	3.08 <sub>ab</sub>	1.06	2.68 <sub>b</sub>	1.15	10.04***
<b>Child Variables</b>							
Technology to satisfy needs	4.61	1.03	4.75	1.00	4.40	1.13	2.43
Disclosure IP	4.03	0.79	4.00	0.76	3.95	0.95	0.42
Disclosure T	3.27 <sub>a</sub>	1.13	3.03 <sub>ab</sub>	1.19	2.66 <sub>b</sub>	1.31	10.02***
Solicit IP	3.85 <sub>a</sub>	0.75	3.84 <sub>ab</sub>	0.72	3.63 <sub>b</sub>	0.89	3.02*
Solicit T	3.10 <sub>a</sub>	1.14	2.96 <sub>a</sub>	1.12	2.53 <sub>b</sub>	1.15	9.68***

Note: IP = In-person, T = Using technology; \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Subscripts indicate significant mean differences identified by Bonferroni pos-hoc analyses.

Table 8: Effect sizes for the model examining associations between parent frequency of choosing technology to satisfy needs and parental solicitation in-person and using technology (study 1, research question 4)

Variable	Estimate	SE	<i>p</i>
Solicitation IP	.05	.02	.028
Solicitation T	.18	.04	.000

Table 9: Correlations and descriptive statistics for all study two variables

<i>Parent Variables</i>	1.	2.	3.	4.	5.	6.	7.	8.
1. Disclosure IP	-							
2. Disclosure T	0.08	-						
3. Parent solicit IP	0.39***	0.28***	-					
4. Parent solicit T	0.12	0.62***	0.57***	-				
5. Age	-0.02	-0.13	-0.09	-0.19**	-			
<i>Child Variables</i>								
6. Disclosure IP	0.33***	0.21***	0.32***	0.26***	-0.13	-		
7. Disclosure T	0.06	0.52***	0.27***	0.59***	-0.21***	0.38***	-	
8. Parental solicit IP	0.28***	0.23***	0.47***	0.36***	-0.12	0.71***	0.38***	-
9. Parent solicit T	0.05	0.47***	0.34***	0.63***	-0.21***	0.33**	0.85***	0.52***
10. Depression	-0.04	0.08	-0.00	0.14	-0.04	-0.10	0.17**	-0.02
11. Anxiety	-0.04	0.07	-0.07	0.05	-0.05	-0.08	0.14	-0.07
12. Prosocial behavior	0.19***	0.20***	0.26***	0.17***	-0.05	0.46***	0.25***	0.41***
13. Delinquency	-0.02	0.07	0.04	0.12	-0.07	-0.05	0.17**	0.05
14. Parent-child closeness	0.22***	0.15**	0.17***	0.14	0.06	0.71***	0.28***	0.49***
15. Age	-0.15**	0.04	-0.12	-0.06	0.28***	-0.12	-0.02	-0.16**
Mean	4.47	3.76	3.67	3.05	43.37	4.06	3.13	3.79
SD	0.59	1.01	0.89	1.13	8.78	0.75	1.15	0.79

Table 9 Continued

<i>Child Variables</i>	9.	10.	11.	12.	13.	14.	15.
9. Parent solicit T	-						
10. Depression	0.20***	-					
11. Anxiety	0.13	0.69***	-				
12. Prosocial behavior	0.25***	-0.02	0.08	-			
13. Delinquency	0.19***	0.40***	0.32***	0.03	-		
14. Parent-child closeness	0.25***	-0.20***	-0.13	0.44***	-0.12	-	
15. Age	-0.05	0.01	0.05	-0.01	-0.04	-0.05	-
Mean	2.91	5.47	6.57	11.88	12.25	4.42	15.32
SD	1.16	2.63	2.65	2.49	3.71	0.60	1.48

Note: IP = In-person, T = Using technology; Correlations were adjusted using the Bonferroni correction to reduce Type 1 error. The p-value needed to reach significance was  $p=.003$  or less, \*\* $p < .003$ , \*\*\* $p < .001$ .

Table 10: Effect sizes for the model examining associations between parental solicitation in-person and using technology and adolescent disclosure in-person and using technology (study 2, research question 1)

Variable	Estimate	SE	<i>p</i>
Disclosure IP	.51	.04	.000
Disclosure T	.72	.02	.000

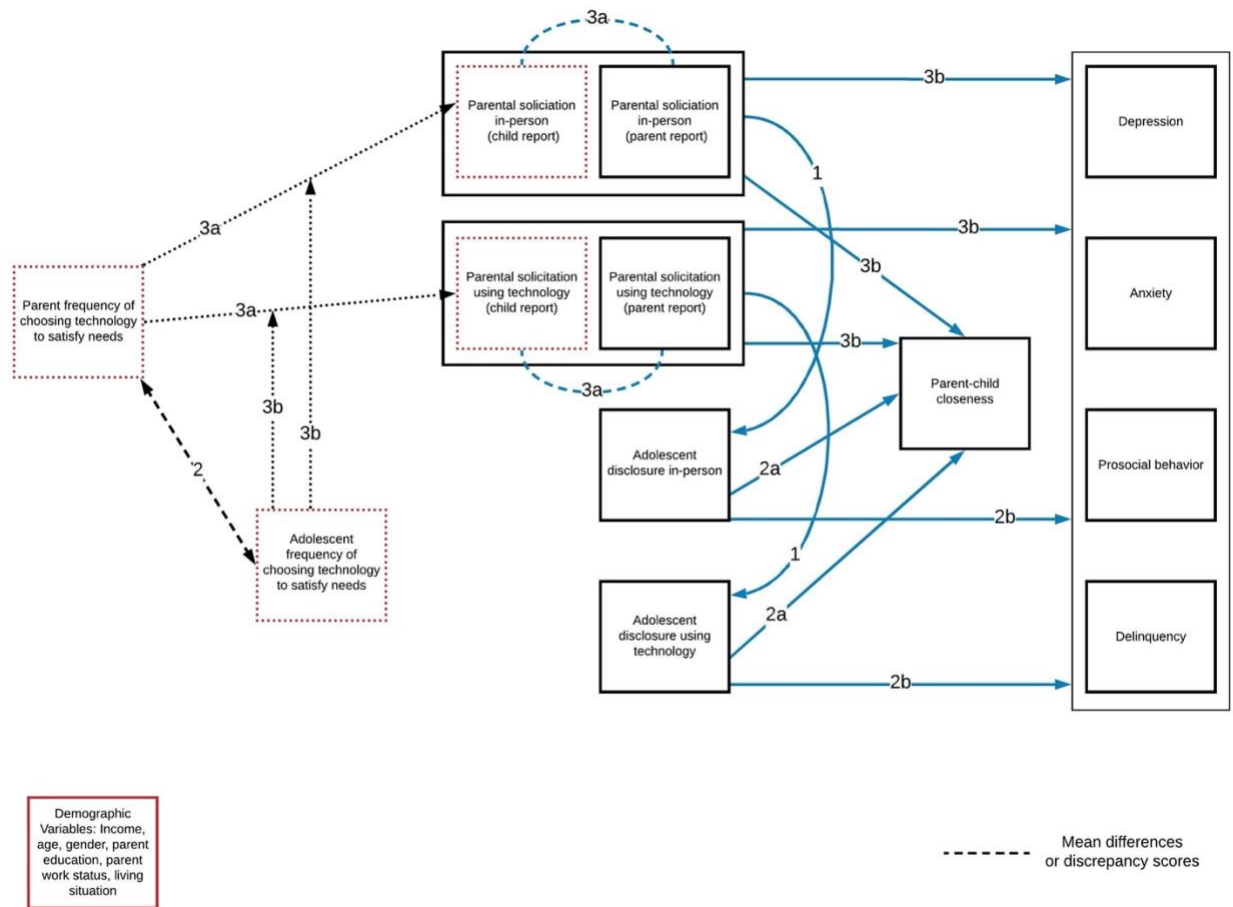
Table 11: Effect sizes for the model examining associations between adolescent disclosure and adolescent outcome variables (study 2, research question 2)

Variable	Estimate	SE	<i>p</i>
Depression	.10	.03	.001
Anxiety	.07	.03	.009
Prosocial behavior	.24	.05	.000
Delinquency	.06	.02	.004
Closeness	.51	.05	.000

Table 12: Effect sizes for the model examining discrepancies between parent and adolescent report of parental solicitation and adolescent outcomes (study 2, research question 3b)

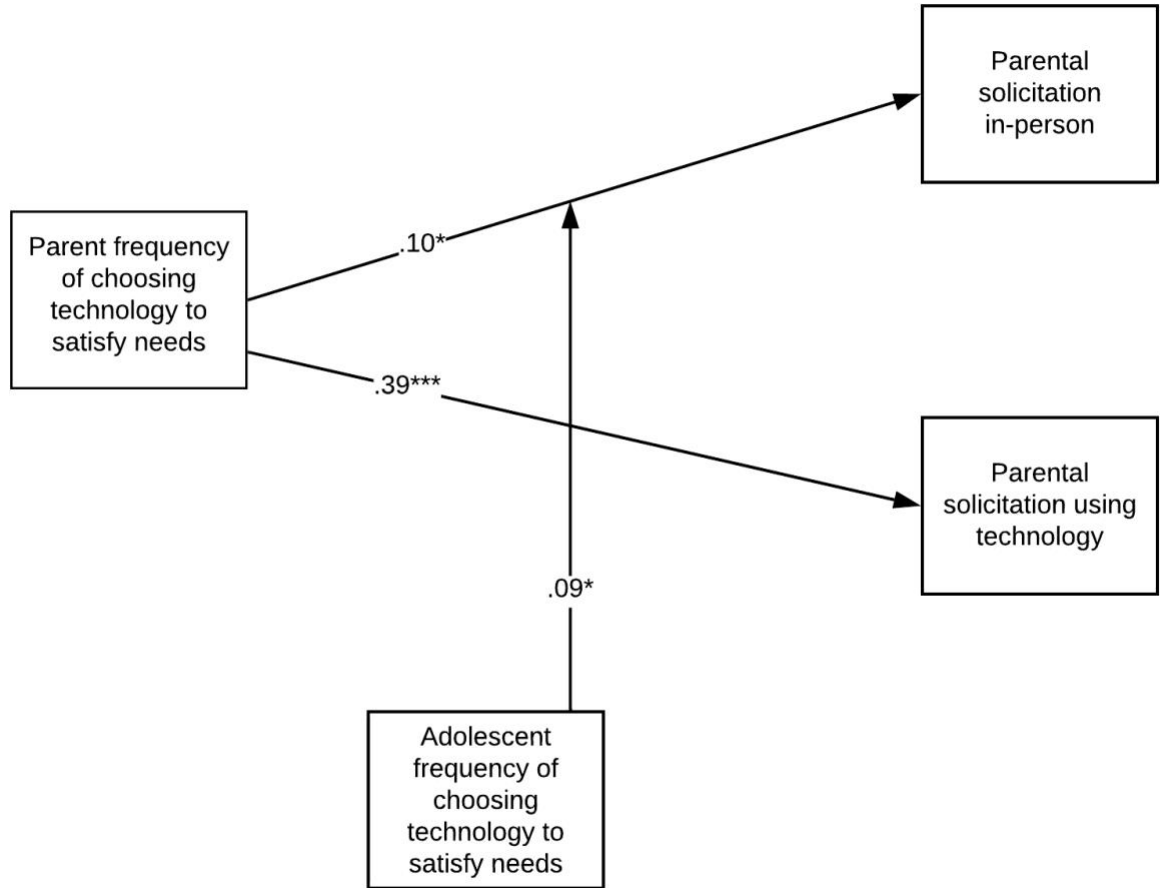
Variable	Estimate	SE	<i>p</i>
Closeness	.05	.02	.021
Depression	.02	.02	.130
Delinquency	.03	.02	.097
Prosocial behavior	.04	.02	.049
Anxiety	.03	.02	.102

Figure 1: Full conceptual model of studies one and two



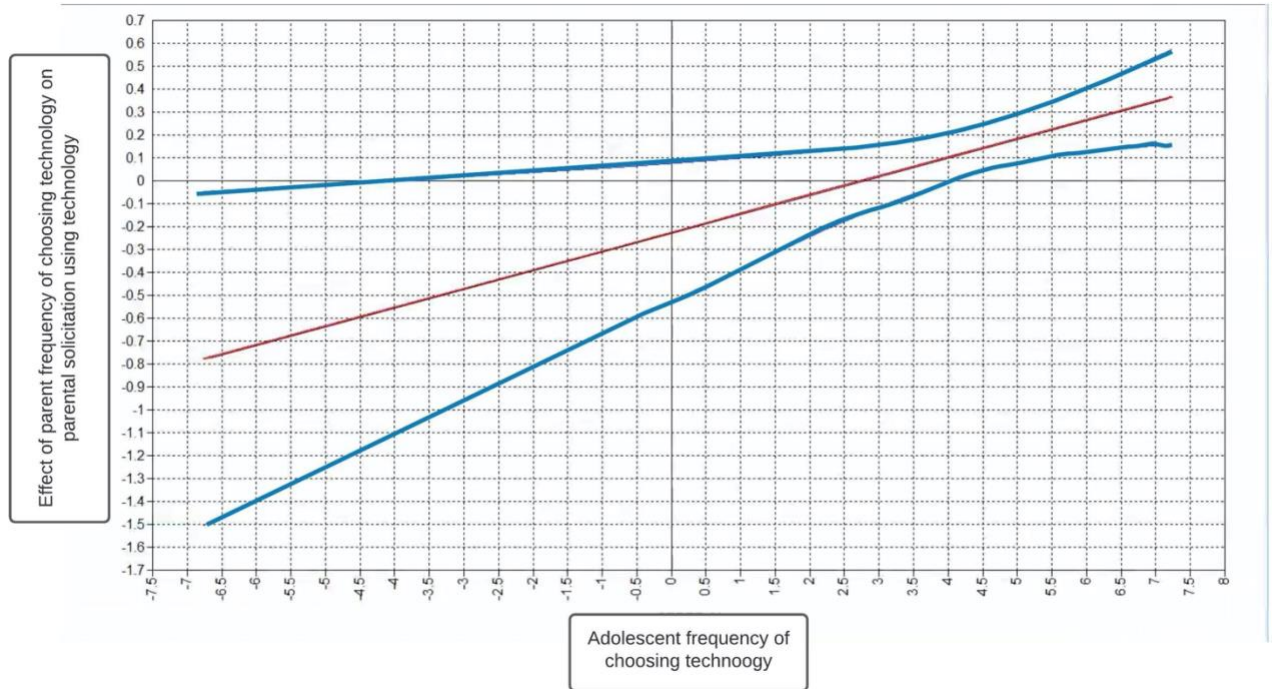
Note: Numbers indicate which research question examined each pathway. Small dotted squares and lines indicate variables and pathways examined in study one, solid lines and squares indicate variables and pathways examined in study two. Large dotted lines indicate pathways where mean differences or discrepancy scores are examined.

Figure 2: Associations between parent frequency of technology use and parental solicitation in-person and using technology, moderated by adolescent frequency of technology use (study one, research questions 3a and 3b)



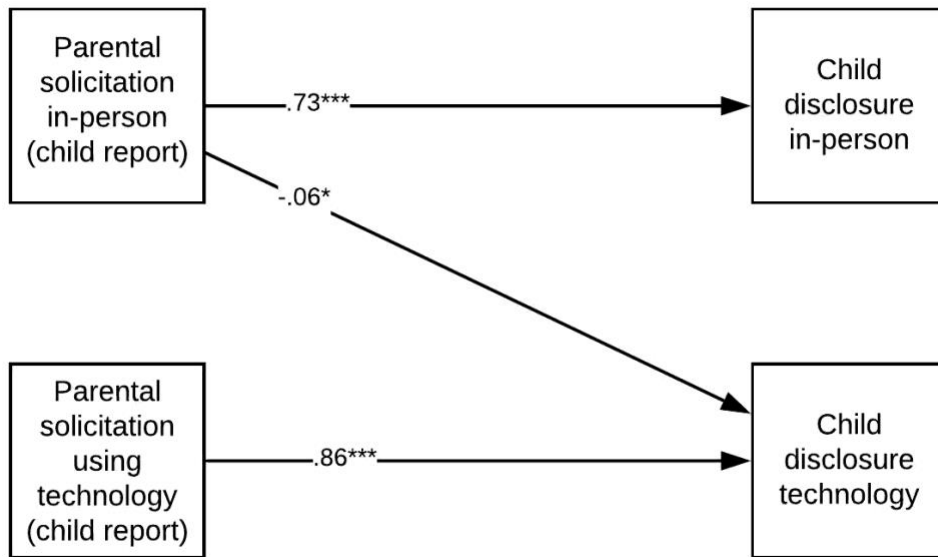
Note: \* $p < .05$ , \*\*\* $p < .001$ . Only significant pathways are included. Control pathways between parent and child gender, parent education, parent work status, and adolescent age and outcome variables are not shown for parsimony.

Figure 3: Johnson-Neyman plot showing regions of significance for moderation analysis (research question 3b)



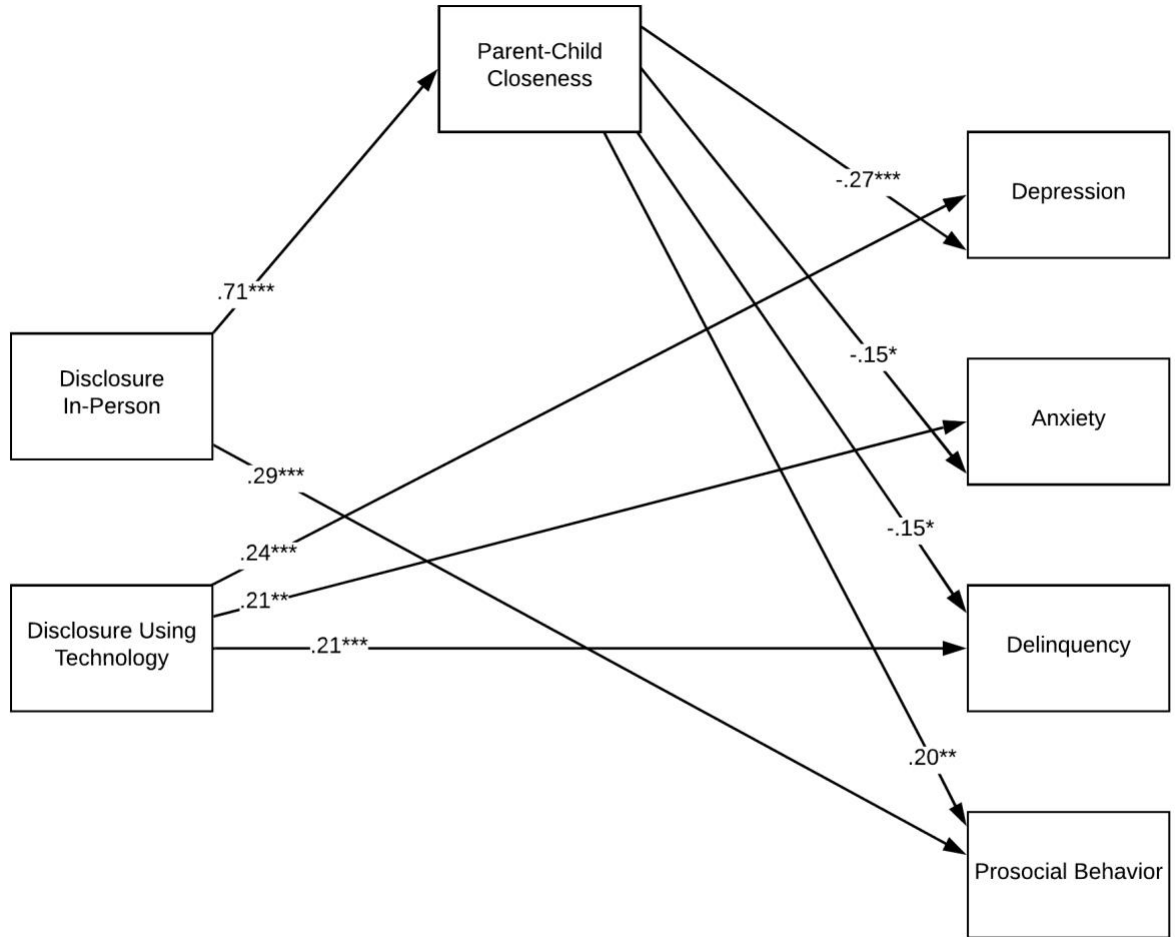
Note: The thin center line represents values of the adjusted effect of parent frequency of choosing technology on parental solicitation using technology that correspond to the continuous values of adolescent frequency of choosing technology. The bolded outside lines represent confidence intervals.

Figure 4: Associations between parental solicitation and adolescent disclosure in-person and using technology (study two, research question 1)



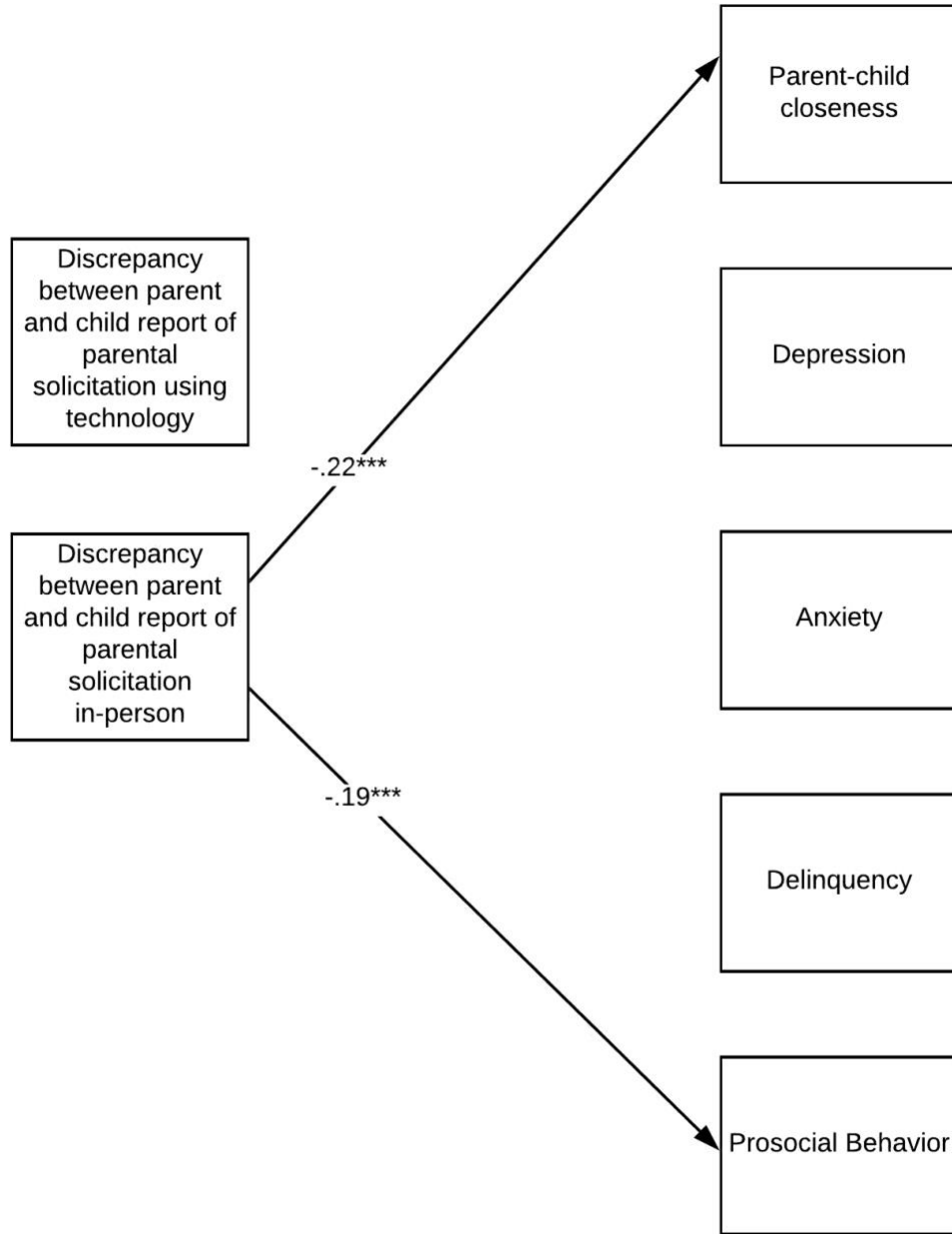
Note: \* $p < .05$ , \*\*\* $p < .001$ . Only significant pathways are included. Control pathways between parent and child gender, parent employment, and adolescent age are not drawn for parsimony.

Figure 5: Associations between adolescent disclosure in-person and using technology and parent-child closeness, depression, anxiety, delinquency, and prosocial behavior (study two, research question 2b)



Note: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Only significant pathways are included. Control pathways between parent and child gender, parent employment, and adolescent age are not shown for parsimony.

Figure 6: Associations between discrepancies in parent and child report of parental solicitation in-person and using technology and parent-child closeness, depression, anxiety, delinquency, and prosocial behavior (study 2, research question 3b)



Note:  $***p < .001$ . Only significant pathways are included. Control pathways between parent and child gender, parent employment, and adolescent age are not shown for parsimony