EFFECTS OF PROBLEMATIC SMARPTHONE USE, SMARTPHONE INTERFERENCE IN PARENTING, AND PARENTAL ATTACHMENT TO THEIR YOUNG CHILD

by

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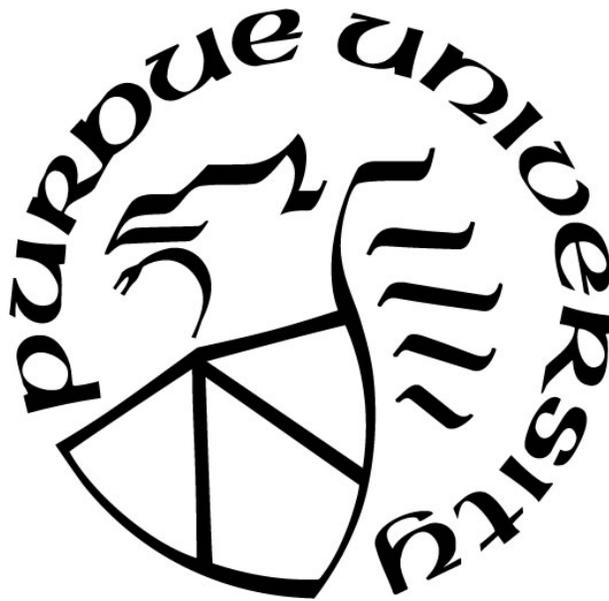
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To Justin, Jax, and Jude, the loves of my life – C.M. J.

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Author: Johnson, Chanelle, M. MS
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Title: Effects of Problematic Smartphone Use, Smartphone Interference in Parenting, and
   Parental Attachment to Their Young Child
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Smartphones have become more and more integrated into not only society, but also parents' lives, causing interruptions and dysfunction amongst families. This study aimed to understand the relationship between problematic smartphone use, smartphone interference in parenting, and parental attachment to child among a sample of 132 parents ($n = 132$) between the ages of 18 and 29 years. It was hypothesized that smartphone interference in various areas of parenting would mediate the relationship between problematic smartphone use and parents' perceived attachment to child. The results of this study found that problematic smartphone use was positively and significantly associated with smartphone interference in parenting and negatively significantly associated with parental attachment to child. However, smartphone interference and parental attachment to child did not have a significant relationship and did not mediate the relationship between problematic smartphone use and parental attachment to child. Control variables of parents' perceived stress, income, and anxiety were significantly correlated with parental attachment to child. Clinical implications, limitations, and future directions for research are discussed.

CHAPTER 1: INTRODUCTION

Statement of the Problem

In recent years, because of an increase in smartphone use, many individuals have begun to more fully integrate this handheld, miniature computer into their lives, perhaps due to its ability to allow the user to access others via communication, manage information, and utilize the many multimedia functions (Cho & Lee, 2017; Pew Research Center, 2018). In fact, 77% of Americans now own a smartphone, which is a significant increase when compared with the 35% of Americans who reportedly owned smartphones in 2011 (Pew Research Center, 2018). The rates of ownership seem to be further divided by age. In fact, 94% of U.S. adults between the ages of 18-29 years reportedly owned a smartphone (Pew Research Center, 2018). Adults between the ages of 30-49 followed closely behind the 18-29 year age bracket in smartphone ownership, with 89% reporting that they were owners of the device (Pew Research Center, 2018). The rise in smartphone ownership rates appear to be negatively correlated with age, as 73% of adults between 50-64 years and 46% of adults 65 years and older claimed to own the device (Pew Research Center, 2018).

Smartphone use has been previously found to have several impacts on people's lives. Generally speaking, technology can lead to intrafamilial conflict and an ability to communicate while avoiding face-to-face interactions with others (Sullivan, 2013). Children's smartphone use is often influenced by their parent's use; smartphone dependency in children can be associated with behavioral problems, inhibited emotional intelligence, social isolation, and a possible lack of social skills and emotional control (Cho & Lee, 2017; Sullivan, 2013). Nevertheless, many parents are unaware of the influence that their own technology use has on their children's technology use, and they may use it in parenting as a means of keeping their children occupied while accomplishing other tasks (Sullivan, 2013). In a study done on children's (ages 8-13 years) perceptions about their parents' mobile device use, 54% of them reported that they felt that their parents checked their devices too often, and 32% of them reported feeling unimportant when their parents were too engrossed in their phones (AVG Technologies, 2015).

As technology grows and shapes how people communicate and interact, it is important to consider how smartphones have shaped individuals of the Millennial (born between 1981 and 1996) and post-Millennial generations (born 1997 and onward) (Dimock, 2018). With the iPhone's first release in 2007, many of these individuals were at a young age when they learned to adapt to smartphone features such as constant connectivity, networking, entertainment and communication (Dimock, 2018).

Some research has suggested a link between problematic parental device use and technology interference in parent-child interactions (McDaniel & Radesky, 2018). Other research has suggested correlations between parental screen distraction and aspects of parent-child attachment, such as parental responsiveness (Blackman, 2015 Radesky et al., 2014; Radesky et al., 2016) and sensitivity behaviors (see Radesky et al., 2015). Because parenting behavior and the quality of parent-child interactions influence child development (Fay-Stammbach, Hawes, & Meredith, 2014; Zimmer-Gembeck et al., 2017), it is important to further examine the impact of parental smartphone use on their children. Heretofore, none of the variables of problematic parental device use, technology interference, or parental attachment to child have been studied simultaneously. This study, therefore, examines how problematic smartphone use influences smartphone interference in parenting, and how that, in turn, affects parental attachment to child.

CHAPTER 2: SIGNIFICANCE OF THE PROBLEM

Technology Interference

Technology interference (or "technoference" as shortened by McDaniel and Coyne, 2016a) is defined as the interruptions that impact interactions with others due to technology devices (i.e. smartphones, phones, tablets, iPods, computer, television, and video games) on a daily basis (McDaniel & Coyne, 2016a; McDaniel & Coyne, 2016b; McDaniel & Radesky, 2018). Technoference was first studied by McDaniel and Coyne (2016a) in couples and was found to be a common occurrence that increased conflict and reduced relationship quality.

McDaniel and Coyne (2016b) further studied the effects of technoference between parents and their ability to parent their children, according to mothers. They found that the more technology interference occurred in coparenting interactions between mother, father, and child, the more likely there were to be reports by the mother of lower coparenting quality, lower relationship satisfaction, and more depressive symptoms. Using scales (Technology Interference in Coparenting Scale [TICS] and Technology Interference in Parenting Scale [TIPS]) that measured how frequently technology interfered in coparenting interactions and in various domains of parenting, participants reported that cell phones/smartphones were most likely to be the technological device that interrupted coparenting interactions. They reported that playtime, spending time with the child, conversations about parenting issues, educational activities, mealtime, bedtime, and discipline/limit setting were the domains of parenting affected by technological devices, with a minimum of 20% of mothers rating it as causing at least some level of interference in their interactions. The domain most commonly reported to be affected by technology interference was playtime when parenting was considered more "unstructured" (p. 441). It is important to note that age also factored into this study, as technology interference was reported to occur more often with children who were older. Technology interference was also less likely to occur with mothers who were older, although the article did not specify what age ranges were classified as older mothers. Limitations to consider in this study include self-report data which may be subject to underreporting of technology interruptions and that this study looked only at mothers, who were mostly all married with some college education. In this study, the TIPS also did not have prior validity data.

McDaniel and Radesky (2018) examined the effects of technology interference between parents and young children by both mothers and fathers. In this study, the researchers looked at the relationship between problematic parent digital technology, technoference in parent-child interactions, and child behavioral difficulties. Parent problematic digital technology use was associated with greater technoference in parent-child interactions. Greater technoference, in turn, was discovered to be positively correlated with the child's externalization and internalizing behaviors in mother-child interactions but not in father-child interactions. It is important to also consider the limitation to this study, which includes possible reporter bias due to self-report being used to obtain survey data.

In these studies conducted by McDaniel and Coyne (2016a; 2016b) as well as by McDaniel and Radesky (2018), it should be noted that technology interference was examined by looking at the brief interruptions in everyday interactions caused by a number of different of technological devices (i.e. smartphones, phones, tablets, iPods, computer, television, and video games). For the purposes of this current study, the brief everyday interruptions caused only by smartphones are examined and are referred to as "smartphone interference."

Smartphones

Ultraportable devices

Smartphones are unique from other technological devices because of their portability, omnipresence, and useful capabilities - voice communication, information management, entertainment, and social interactions (especially via social media sites) (Cho & Lee, 2017; Kushlev, 2015). Other features include texting, taking and sharing photos and videos, and access to the Internet. These technological devices essentially serve as handheld computers and are an advanced version of cell phones that had only calling, texting, and limited entertainment features. Often used intermittently but also frequently, smartphones can be operated from almost any location (Kushlev, 2015). They allow for increased digital connection to others, including those who may live far away, with ease and quickness, but also may reduce the quality of interactions in the immediate physical and social environment because of their potential to be a limitless source of distraction from the present (Chatton, 2017; Johnson, 2017; Kushlev, 2015). In fact, smartphones may inadvertently send a message of exclusion and disconnection from other

people in the smartphone user's immediate environment, as they require the user to look down at a screen and away from those in their presence (Kushlev, 2015). Social connectedness serves as a fundamental need for humankind, so the constant connectivity of ultraportable devices like the smartphone may change this need and lead to the replacement of social interactions with digital ones (Kushlev, 2015).

How parents use their phones

Some parents can be counted amongst the population of smartphone users, and because of the device's ability to be used from almost any location, it is no wonder that parents can also use the device when in the presence of their children. In a qualitative study done with eight participants, parents explained several reasons for using their cell phone while caring for their children: to reduce stress, to subside boredom, to contact friends and family, to provide connection to the outside world, to work, to utilize the GPS, to shop online, to find answers to medical and developmental concerns, to check the time, to gain respite from parenting, and to distract children while the parent completed tasks like showering (Chatton, 2017). Parents from this study also attributed their cell phones to allowing them to "retain part of their pre-parental identities" via access to their parents, friends, media, and email (Chatton, 2017, p. 93). Furthermore, a theme found within the study was that parents used technology to manage difficult situations with their children (i.e. changing diapers or cutting toenails). Chatton (2017) suggested that this may show a change in values from earlier parenting generations, as these difficult moments would previously be used as teaching moments that taught the child to regulate difficult emotions and boredom while also allowing for parent-child connection.

Negative effects of parental smartphone use

Because of its influence on interactions between parents and their children, smartphones have been found to have several negative effects on the parent-child relationship, especially in regard to the quality of interaction. For example, smartphones have been found to decrease parents' perceived social connection with their children while participating in shared activities (Johnson, 2017; Kushlev, 2015) and reduce conversations and engagement in interactions with their children (Chatton, 2017; Johnson, 2017; Radesky et al., 2014; Radesky, et al., 2015). For instance, in a study that observed parents while they ate in a restaurant with their

children, Radesky and colleagues (2014) noticed that caregivers who were highly absorbed by their devices primarily maintained their gaze on their device and either continued to gaze at the screen while speaking with their children, took longer to respond to their children's bids for attention, or did not respond at all. The caregivers who were highly absorbed by their devices also often ignored the child's behavior and then reacted with a negative tone of voice or spoke to the child in a "robotic manner" (Radesky et al., 2014, p. e847). They were deemed to have demonstrated behaviors that indicated rejection and a lack of sensitivity by Radesky and colleagues (2014).

When parents and children have a negative quality of interaction due to parental smartphone use, it appears that a blurred boundary between being present in reality and being present online occurs. As such, some parents describe feeling "sucked into" them (Radesky et al., 2016, p. 697). Apart from blurred presence in reality and online, blurred work-home boundaries also occur (Johnson, 2017; Radesky et al., 2016). In working parents, parental smartphone use has also led to feeling pressured to be continually available to work, thereby blurring these work-home boundaries (Johnson, 2017; Radesky et al., 2016). When these boundaries become too blurred with cell phones, it has been associated with lower family satisfaction and higher distress (Chelsey, 2005). Because parents often admitted to multitasking between home and work, parents stated that they felt more "present" with their children when their phones were not present (Radesky et al., 2016, p. 698).

Parents have self-reported feeling less empathetic with their children after becoming too absorbed in their smartphone devices (Chatton, 2017). With the possibility of such high absorption, smartphones can serve as distractions for parents from their children. Chatton (2017) suggested that because of this, accidents may occur or parents may miss non-verbal communication cues from their children, especially those who are too young to talk. Some research has found that parents who were technologically distracted were more likely to demonstrate decreased responsiveness and sensitivity to their children while distracted and took more time to re-engage with their children once their children attempted to further involve their parents in their interactions (Kildare & Middlemiss, 2017). Another study found that when parents were distracted with excessive social media use while caring for their young children, they were less likely to develop a strong attachment to their children (Ante-Contreras, 2016).

Furthermore, other research has found the role of smartphone use to interfere with family dynamics and relationships. Increased familial conflict has been reported by parents due to issues surrounding technology use within the family, including differing views on usage while in the presence of children (Chatton, 2017). An observational study found themes of caregivers raising their voice at their children while absorbed by their mobile device (Radesky et al., 2014). Due to its continual presence, parental smartphone use has also been found to have a negative influence on their children's behavior. Parents and observational reports indicate that limit-testing and attention-seeking behaviors increased for some children when parents became more deeply absorbed in their mobile device (Radesky et al., 2014; Radesky et al., 2016). This often led to parents reacting negatively to their children's bids for attention (Radesky et al., 2014). It is also important to note that while some children increased bids for attention from their parents when they were absorbed in their device, Radesky and colleagues (2014) also noted observations of some children who responded to their parents' device absorption by appearing to accept it and entertain themselves instead.

Positive effects of parental smartphone use

Although much of the current research lacks support for positive effects of parental smartphone use, it is important to also note that some studies have found evidence of a positive influence on the parent-child interaction. When used for sharing past experiences or obtaining information that would further enhance the current parent-child activity (e.g. using the smartphone to look up information about the exhibit the parent and child were visiting at a museum), parents reported feeling more socially connected to their children (Kushlev, 2015). This parent-child connection has also been found to occur through using a cell phone for shared activities (e.g. looking through photos or videos and watching movies) (Chatton, 2017; Radesky et al., 2014).

Apart from increased connectivity, parents have also reported their cell phones as a helpful tool to reduce stress. For example, some mothers self-reported that using their phones to participate in activities such as social media, email, Internet searches, or games allowed them to cope with stress or boredom (Radesky et al., 2016). In regard to using cellphones to access social media or multiplayer games, mothers also reported the ability to filter their lives from family members that they did not trust while also using them to benefit from social support (Radesky et

al., 2016). For example, one mother stated that she could communicate with certain family members on Facebook without having to give them her phone number (Radesky et al., 2016). Another mother said that she could connect with her own mother through playing a game together on their phones but otherwise did not maintain a close relationship with her (Radesky et al., 2016).

Lastly, while some research has suggested smartphones play a role in family conflict (Chatton, 2017; Radesky et al., 2014), in another qualitative study participants indicated that it helped lessen family conflict (Radesky et al., 2016). Parents specifically reported this as occurring when they were able to use their devices to calm their children when family conflict occurred or was on the brink of occurring (Radesky et al., 2016).

Problematic Smartphone Use

As smartphones have become more integral to many individuals' lives, research has begun to study problematic smartphone use (also often referred to as smartphone addiction and smartphone dependency) within the last several years. Research has also examined the more broadened categories of problematic mobile phone use, mobile phone addiction, and mobile phone dependency, rather than specifically focusing on just smartphones as the technological device in question. Because generalizations about smartphones can be made from findings that termed the technological device as a "mobile phone," this paper cites research looking at problematic usage from both.

Problematic mobile and smartphone use is defined as mobile or smartphone use that leads to problematic issues in the user's life, including issues related to sleeping, financial issues, compulsive behavior, or dependency (Drouin, Kaiser, & Miller, 2015; Wang, Wang, Gaskin, & Wang, 2015). Many have labeled problematic smartphone use as an "addiction," to which Emanuel and colleagues (2015) comment:

> The truth about smartphone addiction is that people are not addicted to their smartphone, they are addicted to the information, entertainment, and personal connections it delivers. People will continue to go to great lengths to connect with others. Smartphones provide a portable, instant way to stay informed, entertained, and connected. (p. 291)

Typically, problematic smartphone use has been studied using samples from college students (e.g., Elhai & Contractor, 2018; Lee et al., 2016; Wang et al., 2015) or adolescents (e.g.

Kwak, Kim, & Yoon, 2018; Lee et al., 2018; Wang, Wang, Nie, Chu, & Jin, 2018). One study that looked at a sample of parents using a variety of technological devices, including smartphones, found that their problematic digital technology use was positively correlated with technology interference in parent-child interactions (McDaniel & Radesky, 2018). However, generally speaking, research is currently lacking in regard to focusing on samples of parents who report problematic smartphone or mobile phone use.

Furthermore, research has looked at the types or characteristics of problematic smartphone and mobile phone users, and many of the findings conflict with one another. For example, some researchers have claimed that mobile phone dependency has a negative correlation with age (Bianchi & Philips, 2005), whereas other research asserts that there are not age differences in problematic use (Burnell & Kuther, 2016). Additionally, some research has indicated that women are more likely to demonstrate problematic mobile phone use behaviors (Beranuy, Oberst, Carbonell, & Chamarro, 2009), while other research has found that men are more likely to do so (Öztunç, 2013). Moreover, some research has found that shyness was positively correlated with problematic mobile phone use (Öztunç, 2013) while other research has indicated that extraverts are more likely to engage in problematic mobile phone use (Hong, Chiu, & Huang, 2012). It should be acknowledged that differences in these studies' findings are likely due to differences in the various demographics of the participants across the studies (i.e. culture, age, etc.).

Problematic mobile and smartphone use has been associated with neuroticism (Thomée, 2018), sleep problems (Drouin et al., 2015; Thomée, 2018), stress (Thomée, 2018), impulsivity (Burnell & Kuther, 2016), engagement in social comparison (Burnell & Kuther, 2016), identity issues (Alavi et al., 2018), other behavioral addictions (Thomée, 2018), as well as psychological issues such as depression (Jenaro, Flores, Gómez-Vela, González-Gil, & Caballo, 2007; Thomée, 2018) and anxiety (Jenaro et al., 2007; Lee et al., 2016; Thomée, 2018). When looking specifically at depression and problematic mobile phone use, it has also been found that people with depression and limited resources and support may develop problematic mobile phone use problems as a means to cope with their negative states, although this was found to be counteracted when they engaged in meaningful connection with others in face-to-face interactions (Kim, Seo, & David, 2015). Higher levels of rumination and cognitive reappraisal strategies are associated with heavier smartphone use, which was also associated with

problematic smartphone use (Elhai & Contractor, 2018). The type of smartphone usage also plays a role in problematic use and anxiety, as process smartphone usage (using smartphone for non-social-related activities such as for entertainment, relaxation, and news consumption) has been discovered to have a stronger association with problematic use than social smartphone use (i.e. using the smartphone for activities such as social networking or messaging) (Elhai, Levine, Dvorak, & Hall, 2017). Additionally, entertainment and escapism motivation are more likely to lead to problematic smartphone use in individuals who report high stress levels (Wang et al., 2015).

Couple and Family Technology Framework

Current research and literature on the impact of smartphones and other technological devices often tends to ignore a systemic perspective and focus, instead, on just the individual perspective. Systemic perspectives with regards to technology should be examined, however, because it allows for a broader picture of family relationships and dynamics to be addressed. One such theoretical model that allows for the development of this systemic understanding is that of the Couple and Family Technology (CFT) Framework (Hertlein & Blumer, 2014). This multitheoretical framework examines how familial processes (using an interaction-constructionist perspective) and structures (using a structural-functional perspective) change based on ecological elements of technology (Hertlein & Blumer, 2014). In this model, structure is defined as the familial roles, rules, and boundaries, and processes are defined as relationship initiation, relationship maintenance, and relationship dissolution (Hertlein & Blumer, 2014). Ecological elements associated with technology, recognized as acceptability, anonymity, accessibility, affordability, approximation, and accommodation, are examined for the benefits and challenges that technology brings to relationships (Hertlein & Blumer, 2014).

Problems within the family arise when there are varying ideas about the structure and function of technology within the family (Hertlein & Blumer, 2014). As such, structure must be renegotiated with regards to technology to examine what roles, rules, and boundaries best yield family satisfaction (Hertlein & Blumer, 2014). Additionally, families must modify family processes by examining how technology can allow for the development and maintenance of intimacy as well as the development of new ways of interacting within the family (Hertlein & Blumer, 2014).

This framework has been applied to couple's therapy (Hertlein & Hawkins, 2012), video gaming issues in couples (Hawkins & Hertlein, 2013), and improving youth maladaptive behavior using video gaming (Curtis, Phenix, Munoz, & Hertlein, 2017). Utilizing the CFT framework can help understand how to clinically apply the results from this paper to family functioning.

Attachment Theory

Attachment theory originated as a result of Bowlby and Ainsworth's (two key contributors to attachment theory) interest in how parent-child interactions influence personality development (Ainsworth & Bowlby, 1991). Indeed, attachment theory can help guide researchers in examining the interactions within intimate family relationships, and therefore, family functioning (Johnson, Ketring, & Abshire, 2003).

Bowlby (1969/1982; 1988), the original creator of attachment theory, proposed that the attachment system came about because it was environmentally adaptive for humans and other species, as the primary purpose of attachment is to protect them from predators in the environment. He argued that it continues to remain environmentally adaptive, as modern times still provide contexts of endangerment and disaster to humans (Bowlby, 1973). Bowlby's work, therefore, states that attachment behavior is demonstrated by individuals (both children and adults) who are seeking proximity to someone who has the ability to protect them and maintain their survival in the world (Bowlby, 1988).

There are several cues that the attachment system is at work through the display of attachment behavior. In children, this looks like behavior that seeks to maintain close proximity and contact with their attachment figure, especially one with which they have an enduring attachment bond (Bowlby, 1988). In infancy, children learn to predict their caregivers' behavior based on repeated interactions with them (Weinfield, Sroufe, Egeland, & Carlson, 2008). In fact, attachment influences the development of internal working models, which are the intergenerationally-transmitted blueprints that guide individuals' behavior toward others and help predict how others will behave in the present and in the future (Bretherton, Biringen, Ridgeway, Maslin, & Sherman, 1989; Bretherton & Munholland, 1999; Johnson et al., 2003). When individuals identify a pattern of attachment behaviors based on multiple experiences, they develop an attachment script, which is a mental representation of this pattern (Waters & Waters,

2006). Examining attachment scripts of two individuals (e.g. between a parent and child) in a relationship illustrates what their mental representations of their relationship is and "how the internal working models of each are being played out in the relationship" (Johnson et al., 2003, p. 335). Attachment scripts are necessary to measure within families because of the information they give us about parent-child relationships (Johnson et al., 2003).

During infancy and childhood, attachment bonds are formed when caregivers demonstrate a pattern of comfort, protection and support to the child (Bowlby, 1988). Children learn to develop a secure attachment when their parent is available, sensitive, and responsive (Bowlby, 1988), and when this does not consistently and reliably occur, children may develop what is observed as indifference or hostility toward their attachment figure (Ainsworth & Bowlby, 1991).

Ainsworth's development of the Strange Situation, a procedure where infants are briefly separated from their mothers in order to activate distress and the attachment behavioral system and demonstrate the relationship between attachment, fear, and exploration, show that there are four main attachment types of attachment – secure, avoidant, resistant, and disorganized/disoriented (Ainsworth, Blehar, Waters, & Walls, 1978; Main & Solomon, 1990). Secure attachments are indicative of infants who use their caregivers as a secure base when exploring their environment, checking in with their caregivers every so often, becoming distressed when their caregiver is separated from them, seeking and receiving comfort from the caregiver when reunited, and typically resuming exploration thereafter (Weinfield et al., 2008).

Infants who demonstrate an avoidant attachment style often will play with toys but not bid for attention from their caregivers (Waters, Wippman, & Sroufe, 1979, Weinfield et al., 2008). They will typically not show distress when separated from their caregiver, will often ignore and avoid them when they return, and will not seek to maintain contact if their caregiver tries to initiate it (Weinfield et al., 2008). Resistant attachment styles are composed of infants who do not use their caregiver as a secure base to explore their environment, seek to maintain continuous contact with the caregiver, become very distressed when separated from them, and seek contact or proximity from their caregiver upon reunion (Weinfield et al., 2008). They often seek contact during this reunification but become angry and resistant toward it once contact is made (Weinfield et al., 2008). Lastly, an infant who has a disorganized attachment has

difficulty using any specific attachment strategy when distressed and demonstrates conflicted, contradictory, or disoriented behaviors (Main & Solomon, 1990).

The way that the parent treats their child will influence their attachment (Bowlby, 1988). The child's attachment type often then persists because their parents tend to provide a consistent pattern of responses to the child's behavior (Bowlby, 1988). However, it should be noted that early attachment relationships are not destiny and can change given an appropriate environment (Weinfield et al., 2008).

Healthy attachment has many positive effects on children, and the main effect is that children feel safe enough to explore and learn in their environment (Ainsworth & Bowlby, 1991; Ainsworth & Wittig, 1969; Bowlby, 1988). Ainsworth describes this as children needing a "secure base," or the knowledge that an attachment figure who can provide reassurance, comfort and protection is available and nearby while they explore and develop (Ainsworth et al., 1978).

Furthermore, secure attachments are associated with more positive parent-child interactions during toddlerhood (Waters et al., 1979) and more positive peer interactions in preschoolers (LaFreniere & Sroufe, 1985). In childhood, those children who had previously formed secure attachments are often better able to form quality relationships with others, create a positive self-concept, demonstrate greater social competence (Thompson, 2008), and be more adept at emotional regulation (Thompson & Meyer, 2007). Attachment research has also indicated that early attachment security is also associated with emotional health, self-esteem, self-confidence, positive affect, and ego resiliency in childhood and adolescence (Sroufe, Egeland, Carlson, & Collins, 2005). Secure attachments have also been proposed to have a long-term effect on self-understanding and lower risk for psychopathology (Thompson, 2008), and early attachment bonds may have long-term consequences for later-life functioning (Magai, 2008).

Parental responsiveness

The concept of responsiveness is based on a parent's interaction with their child, in which the child gives an attachment signal and the parent gives an appropriate response to it in return (Solomon & George, 2008). Essentially, responsiveness is based on the ability to understand others' needs and communicate this understanding to them through showing care and concern (Aylor & Oppliger, 2003; Wanzer & McCroskey, 1998). Responsiveness has also been defined

in relation to a child's distress and has been viewed as a parent's response ranging from hostile, dismissing, or distressed to sensitive, comforting, and helping (Gottman, Katz, & Hooven, 1996; Roberts & Strayer, 1987).

Parents who demonstrate responsiveness to their children when children are signaling protection or comfort help the child feel safe, which helps them build trust with and a secure attachment to them (Ainsworth et al., 1978; Bowlby, 1988; Grusec, Goodnow, & Kuczynski, 2000). When studying infants and their mothers, Ainsworth concluded that it was the infant's confidence in their mother's ability to be responsive to their signals in their day-to-day interactions that led to a secure attachment (Kobak & Madsen, 2008). When parents are sensitively responsive, this secure attachment allows the child to engage in exploration and play (Thompson, 2008). Insecure attachment relationships arise when, based on previous patterns of interaction, the caregivers have signaled through unresponsiveness or ineffective responsiveness that they are not consistently available, able to comfort their distressed child, or give their child needed resources (Thompson, 2008; Weinfield et al., 2008). Thompson (2008) frames children's insecure attachment behaviors as "necessary means of obtaining needed resources in alternative ways" (p. 353). Bowlby (1973) further applied the importance of responsiveness to individuals beyond the infant years when he explained, "Whether a child or adult is in a state of security, anxiety, or distress is determined in large part by the accessibility and responsiveness of his principal attachment figure" (p. 23).

Responsiveness has been measured using a variety of methodological procedures and operational definitions; as such, various results have given further information about the concept of responsiveness. For example, Davidov and Grusec (2006) measured responsiveness using parents' self-report of their reactions to their children's distress and found that mothers and fathers who demonstrated responsiveness were more likely to be effective in helping their children regulate negative emotions. It also predicted their children's ability to be empathic and to engage in prosocial behavior when they were interacting with others who were distressed. Edelstein and colleagues (2004) measured responsiveness using videotaped observations of parents' emotional availability based on the coding of four interrelated elements of responsiveness, namely sensitivity, structuring, non-intrusiveness, and non-hostility. They found a negative correlation between children's level of distress and the parent's level of responsiveness and also noted that when children were distressed, parents' level of avoidance we

negatively correlated with their level of responsiveness. Notaro and Volling (1999) reported findings that indicated that parental responsiveness, measured through videotaped observations of parental behaviors toward their infant child's distress, did not predict whether the parent-child attachment relationship was classified as secure or insecure.

Parental sensitivity

Parental sensitivity has been defined as the parent's ability to perceive infants' signals accurately and then respond appropriately (Ainsworth, Bell, & Stayton, 1974; Braungart-Rieker, Garwood, Powers, & Wang, 2001; De Wolff & van IJzendoorn, 1997). It is an element of attachment. Indeed, research indicates that parents who are sensitive to their child's signals contribute toward a secure attachment (Bowlby, 1988, De Wolff & van IJzendoorn, 1997), although De Wolff and van IJzendoorn (1997) further concluded through a meta-analysis of attachment and sensitivity that sensitivity is neither the sole, nor most important factor that contributes to a secure attachment.

Research has yielded various results on the effects of parental sensitivity. When defined as the parent's ability to interpret their infant's signals accurately and respond accordingly, research has shown that infants whose mothers had higher levels of sensitivity were more likely to have a secure attachment relationship with their mother (Braungart-Rieker et al., 2001). When parents were secretly observed interacting with their infant during free play, it was found that that parental sensitivity contributed toward the attachment status observed with mothers and fathers (Fuertes, Faria, Beeghly, & Lopes-dos-Santos, 2016).

In summary, two important components of attachment theory are caregiver responsiveness and sensitivity. These components allow children to feel safe in the world and that their parents can be relied on to aid them when needed. As previously discussed, much of the research on parental smartphone use has produced findings that when parent are using their smartphones, they feel disconnected from their children, decrease their conversations and engagement levels with their children, fail to respond to their children's bids for attention, and respond negatively toward children's interruptions (Chatton, 2017; Kushlev, 2015; Radesky et al., 2014; Radesky et al., 2015; Radesky et al., 2016). These findings all have implications for parental responsiveness and sensitivity toward their children. In fact, Kildare and Middlemiss

(2017) have supported this notion by concluding that technological distractions may lead to decreased responsiveness and sensitivity.

Adult attachment research

Although a large body of attachment research focuses on the child's attachment to their parent, some attachment research has also investigated adult's attachment. Often, this has been applied to attachment in romantic relationships (e.g. Mohr, Cook-Lyon, & Kolchakian, 2010; Sigurdsson, Lydsdottir, Olafsdottir, & Gudjonsson, 2008, Stackert & Bursik, 2003). In fact, in a 25-year review of adult attachment instruments, Ravitz, Maunder, Hunter, Sthankiya, and Lancee (2010) found that attachment instruments were often utilized with a relationship focus on adult's attachment to their romantic partners or on children's attachment to their parents. In this review, the instruments cited to aid in measuring parents' attachment to their children were only the Maternal Separation Anxiety Scale (which, as indicated by the title of the scale, emphasized maternal separation anxiety) and the Revised Inventory of Parental Attachment (which is the proposed scale for use in this research proposal and will be discussed more in depth later in this paper). It is important in research to look to include both the parents' and child's perspectives in regard to the attachment scripts for the parent-child relationship so that the extent to which both individuals view their attachment relationship similarly can be verified (Johnson et al., 2003). Doing so also allows for an increased understanding in how both parent's and children's mental representations of their relationships shape individual, dyadic, and family functioning (Johnson et al., 2003). This study hopes to add to this research from the parents' perspective, especially because this perspective appears to be largely ignored by researchers.

Attachment research and technology

Attachment research and technology is quite limited as well, with the majority of the research focusing on technology use by adults with their attachment relationships to other adults. With regard to romantic relationships, smartphone interference had a negative correlation with relationship satisfaction (Polezoes, 2017). Additionally, Wardecker, Chopik, Boyer, and Edelstein (2016) examined individuals' attachment styles and found that their varying attachment styles influenced how they communicated with their romantic partners (e.g. via face-to-face, text messaging, email, etc). Furthermore, one study noted that individuals have reported

less attachment anxiety over the period of a decade in which technology use was simultaneously becoming more integral in people's lives (Chopik & Peterson, 2014). College students who used cell phones problematically were more likely to have negative parent and peer attachment (Lepp, Li, & Barkley, 2016). Research that has been done between parent's technology use and its effect on the parent-child relationship has looked at elements of the attachment relationships such as responsiveness, sensitivity, and the quality of the relationship itself, as discussed in this paper heretofore (see Ante-Contreras, 2016; Chatton, 2017; Johnson, 2017, Kushlev, 2015; Kildare & Middlemiss, 2017; Radesky et al., 2014; Radesky et al., 2015; Radesky et al., 2016). Again, this paper aims to add to the body of literature that examines parent-child attachment relationships and smartphones with a specific focus on the parent's perceived attachment to their child.

Variables and Operational Definitions

This study examines three different variables. The first variable is problematic smartphone use, which looks at the degree to which the parents' smartphone causes problems in a variety of areas in their lives. It is operationally defined as the number of problematic smartphone use symptoms (Merlo, Stone, & Bibbey, 2013). This variable is included in this study in order to examine if it has an effect on smartphone interference in parenting. Smartphones are specifically focused on because not only do they have added features (such as internet) to the traditional cell phone features of texting and calling (Ames, 2013), but they also are constantly available to engage in (Oulasvirta, Rattenbury, Ma, & Raita, 2012). This constant potential to be connected with others causes individuals to always have the opportunity to be distracted (Oulasvirta et al., 2012).

The next variable is that of smartphone interference in parenting interactions with their children and looks at the extent to which parenting is interrupted by parental smartphone distraction. This variable is derived from the concept of technology interference, which as previously mentioned, is when parenting interactions are interrupted by parents using technological devices (i.e. smartphones, phones, tablets, iPods, computer, television, and video games). Instead of looking at the interference caused by these variety of technological devices, this study specifically focuses on just the interference caused by smartphones. Based on McDaniel and Coyne's (2016b) definition of technology interference in parenting, the variable of smartphone interference for this study is operationally defined as the parent's perception of

the frequency of smartphone interruptions during parenting interactions. This variable is included in my study to examine how smartphone interference influences parental attachment to child.

Parental attachment to child is the third variable and examines the parent's perception of their attachment relationship to their child. It is operationally defined as the frequency with which parent attachment scripts are played out between the parent and child (Johnson et al., 2003). In this study, the parental attachment script focuses on the attachment dimension of trust and avoidance. This variable is included in my study to examine how parental attachment to child is influenced by smartphone interference and problematic smartphone use. This variable in particular is explored because parent attachment to child may have implications for the well-being of their child both in the present parent-child relationship and in the child's future.

<div align="center">**Research Question and Hypotheses**</div>

A mediation model will be used to test the following research question. Each hypothesis that follows helps illustrate the mediation model that answers this research question.

Research Question

Does smartphone interference in parenting mediate the relationship between problematic smartphone use and parental attachment to child?

Hypothesis 1

Problematic smartphone use will be positively related to smartphone interference.

Hypothesis 2

Problematic smartphone use will be negatively related to parental attachment to child. This relationship will lose its significance when smartphone interference in parenting is added to the model.

Hypothesis 3

Smartphone interference in parenting will be negatively related to parental attachment to child.

```
                  ┌─────────────┐      ┌─────────────┐      ┌─────────────┐
                  │ Problematic │      │ Smartphone  │      │  Parental   │
                  │ Smartphone  │  →   │Interference │  →   │ Attachment  │
                  │    Use      │      │ in Parenting│      │  to Child   │
                  └─────────────┘      └─────────────┘      └─────────────┘
```
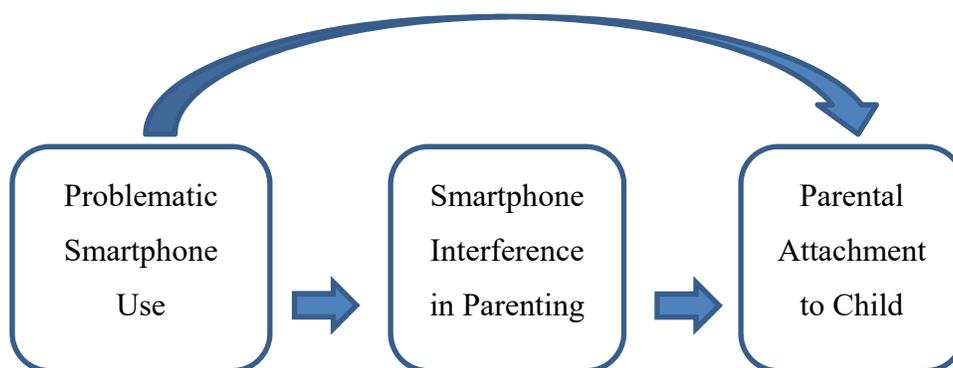
Figure 1. Hypothesized Model

CHAPTER 3: METHODOLOGY

Participants

First and foremost, participants in this study indicated that they were smartphone owners. Because parents who use smartphones are the focus of this study, this selection criterion allowed this specific population to be studied. If participants indicated that they did not own a smartphone, they were excluded from the study.

Furthermore, participants in this study were between the ages of 18 and 29 years. This age bracket is targeted because when compared with older age groups, this age group has grown up extensively with technology, and therefore may display greater levels of problematic smartphone use. Moreover, it is important to examine this particular age group in relation to parenting behaviors because it possible that the consequences of problematic smartphone use from today's generation of young adults and future young adults will have lasting effects on their offspring's development if not otherwise prevented.

An additional criterion was that the participants are parents or legal guardians of at least one child under the age of 18 years, which is based on a criterion for parents and caregivers from Radesky and colleagues' study (2016). It should be noted that these participants self-identified as "parent or legal guardian", which can have different meanings to different people. For example, some people may have identified as a "parent" but could also have self-identified as a "step-parent" if given the option.

Moreover, participants must have had contact with their child for 20 hours or more per week, which is based on a criterion from Blackman's dissertation (2015). This criterion was specified because in order to measure the parental attachment relationship to their child, the parents or legal guardians must spend enough time to interact with them. Twenty hours seemed a reasonable amount of time to do so and had been a specified criterion in a similar study that looked at parental screen time, parental screen distractions, and parenting behaviors (Blackman, 2015).

Lastly, a criterion for this study was that the participants needed to live in the United States.

In regard to the number of participants needed for this study, a power analysis indicated a sample size of 107 participants (Cohen, 1992). This number of participants was increased to 200 participants in order to cushion for missing data and allow for room for error.

Control Variables and Other Variables

For the purposes of this study, eight control variables were included. These consisted of stress level, depression, anxiety, age of child, parent gender, parent race/ethnicity, parent income level, and parent educational level.

Other variables were inquired about in the survey for additional demographic information but were not utilized as control variables. These variables included how parents use their smartphones, whether their spouse/partner currently lives with them, how many children they have, and parent's age.

Procedure

Amazon Mechanical Turk (MTurk) was used to collect participants and administer the survey. MTurk is an online website that crowdsources small online tasks and surveys to its users in exchange for nominal financial compensation (Arditte, Cek, Shaw, & Timpano, 2016; Shank, 2016). For this study, each participant was compensated a small fee of $0.40 for completing the survey.

MTurk is composed of registered individuals who take on two different roles – "requesters" or "workers" (Amazon Web Services, Inc [AWS], 2019; Buhrmester, Kwang, & Gosling, 2011). Requesters are individual people, companies, or organizations that submit tasks (e.g. surveys, experiments, writing, etc.) to MTurk for workers to complete online (AWS, 2019; Buhrmester et al., 2011). Workers browse the MTurk website to find, accept, and complete these tasks (AWS, 2019; Buhrmester et al., 2011). Requesters then pay workers for the successful completion of the task (AWS, 2019; Buhrmester et al., 2011). It should be noted, however, that requesters can refuse payment for unsatisfactory work as well as require workers to have low refusal rates based on previous completed tasks (Buhrmester et al., 2011).

MTurk has been found to be both quick to deliver high-quality, reliable research data and is helpful in its access to diverse populations that may not be found in the local community (Arditte et al., 2016; Buhrmester et al., 2011; Casler, Bickel, & Hackett, 2013; Shank, 2016). In

fact, one study by Casler and colleagues (2013) recruited samples from in-person traditional undergraduates, social media, and MTurk, and found that MTurk participants were significantly more diverse than the other two sample groups, especially in terms of socioeconomic status and ethnicity. Furthermore, this study found that both online and face-to-face test takers answered similarly, suggesting that online participants garnered from MTurk will produce similar results in comparison to results from in-person participants. Some research, however, suggests that MTurk samples are not always so representative, with some findings indicating samples to be composed of more females, individuals with higher education and income levels, and individuals who are slightly younger than the average American in the general population (Paolacci, Chandler, & Ipeirotis, 2010). Moreover, some research on MTurk participants discovered participants to have more elevated levels of psychological symptoms than the general population (Arditte et al., 2016).

While using MTurk, workers can be led to an external online link set up by the requester to complete tasks such as surveys (Buhrmester et al., 2011). For this study, Qualtrics was the external online survey tool that was linked to MTurk and was used to manage the data.

Instrumentation

This study utilized a demographic questionnaire, Problematic Use of Mobile Phone (PUMP) scale, Technology Interference in Parenting Scale (TIPS), and the trust/avoidance subscale from the Revised – Inventory of Parent Attachment (R-IPA).

Demographic Questionnaire

In order to gather general demographic information, questions were asked regarding how the parent uses their smartphone, the age of parent, the age of the child, the parent's gender, the parent's race/ethnicity, the parent's income level, and the parent's educational level, whether their spouse/partner currently lives with them, and how many children they have. Participants were also asked about perceived stress level, anxiety, and depression.

Perceived stress level was measured using the 10-item version of the Perceived Stress Scale (PSS-10; Cohen, 1994), which is based on participants' self-report of their current perceptions of stress levels. It includes items such as "In the last month, how often have you felt nervous and "stressed"?" and "In the last month, how often have you felt that you were unable to

control the important things in your life?" which are scored on a 5-point Likert scale from 0 (never) to 4 (very often). Four items on the PSS-10 are reverse-scored: "In the last month, how often have you felt confident about your ability to handle your personal problems?" "In the last month, how often have you felt that things were going your way?" "In the last month, how often have you been able to control irritations in your life?" and "In the last month, how often have you felt that you were on top of things?" Additionally, the PSS-10 has good internal consistency with a Cronbach's alpha ranging from .86 to .89 in various studies (Perera et al., 2017; Roberti, Harrington, & Storch, 2006).

Anxiety and depression were measured using the American Psychiatric Association's (2013) DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure – Adult. This instrument is being developed and is used to screen for the possibility of the presence of various symptoms of psychopathologies but is not used as the sole indication for a clinical diagnosis of any of the psychopathologies. The instructions for this scale ask the participant to answer the following question "During the past TWO (2) WEEKS, how much (or how often) have you been bothered by the following problems?" and then lists the various statements according to each domain's psychopathology. The anxiety domain was used to measure anxiety, with the following questions being used: "Feeling nervous, anxious, frightened, worried, or on edge?", "Feeling panic or being frightened?", and "Avoiding situations that make you anxious?". The depression domain will be used to measure depression, with the following questions being asked "Little interest or pleasure in doing things?" and "Feeling down, depressed, or hopeless?". A 5-point Likert scale measures responses ranging from 0 (none or not at all) to 4 (severe or nearly every day). A rating of 2 (mild or several days) on any item within the domain is indicative of a possible existence of that particular psychopathology. Because it is a screening instrument, this scale does not mention whether or not the total or the average should be taken to analyze data, so the total score for each subscale was chosen to analyze the data from the survey.

Additionally, the Cronbach's alpha has not been tested for the total of the depression subscale nor for the total of the anxiety subscale. However, each individual item for each subscale has been tested in the DSM-5 field trials. For the depression subscale, item 1 had a Cronbach's alpha of .66 and item 2 had a Cronbach's alpha of .78 (Narrow et al., 2013). For the anxiety subscale, there was a Cronbach's alpha of .67 for item 1, .70 for item 2, and .64 for item 3 (Narrow et al., 2013).

Problematic Use of Mobile Phone (PUMP) Scale

In order to measure the problematic smartphone use variable, the Problematic Use of Mobile Phones Scale (PUMP) was used (Merlo et al., 2013). This scale is comprised of 20 questions and is measured with a 5-point Likert Scale ranging from one (strongly disagree) to five (strongly agree). It measures symptoms of problematic mobile phone use based on the following categories: tolerance, withdrawal, "longer time than intended," "great deal of time spent," craving, "activities given up or reduced," "use despite physical or psychological problems," "failure to fulfill role obligations," "use in physically hazardous situations," and "use despite social or interpersonal problems" (Merlo et al., 2013, p. 4). With the inclusion of all of these symptoms, an accurate depiction of dependence is made. Examples from the scale include "The amount of time I spend using my cell phone keeps me from doing other important work," "I have ignored the people I'm with in order to use my cell phone," and "It would be very difficult, emotionally, to give up my cell phone." Additionally, the PUMP Scale has an excellent internal consistency ($\alpha = .94$). It should be noted that instances where the question referred to "cell phone" was replaced with the word "smartphone," as smartphones are the specific focus for this study.

Technology Interference in Parenting Scale (TIPS)

The Technology Interference in Parenting Scale (TIPS; McDaniel & Coyne, 2016b) was used to measure the variable of smartphone interference in parenting. This scale was originally developed with a focus on how technology interference affected everyday couple interactions (McDaniel & Coyne, 2016a), but was then adapted to examine the everyday interruptions in parenting and coparenting interactions (McDaniel & Coyne, 2016b) and then in parent-child interactions (McDaniel & Radesky, 2018). The TIPS examines technology interruptions in the following parenting domains: playtime, spending time with child (NOT including feeding, changing, or play), educational activities (e.g., reading books), mealtime, bedtime, discipline/limit-setting, getting child ready for day, shopping trips, naptime, bath time, changing diapers, dressing, and nighttime. The parenting domain from the TIPS that is excluded in this study was the domain focusing on conversations about parenting issues, as this does not apply to parent-child interactions.

TIPS is a self-report scale and is measured based on the parent's perceptions. Higher scores on this scale represent greater technology interference. The TIPS has a good internal consistency ($\alpha = .90$).

McDaniel and Coyne (2016b) introduced the survey by giving the following instructions: "Participants were asked to think only about times when these domains happened and respond concerning how frequently technology interfered during these instances of parenting" (p. 438). The parenting domains were then listed and rated based on a 5-point Likert scale: 0 (never), 1 (rarely), 2 (sometimes), 3 (often), and 4 (very often). This same procedure was used for this study. However, because another scale in this study was a parenting-related scale (Revised-Inventory of Parent Attachment) that required parents to respond to statements based on their oldest child, this study added this same requirement to the instructions of the TIPS. In doing so, this ensured that all parenting-related assessments were based on parents' experiences with the same child, thus increasing reliability of the data.

It should be noted that when McDaniel and Coyne (2016b) utilized the TIPS, they asked participants to think about when technology interfered with their own and their partner's parenting. This study excluded how parents think that technology interfered with their partner's parenting because of its focus on the parents' own perceptions. Additionally, the TIPS was designed to measure technology interference with various technological devices, but this study intended to focus on smartphone's specific technological interference. Therefore, the wording in the survey was phrased from how frequently technology interfered to how frequently smartphones interfered.

Revised – Inventory of Parent Attachment (R-IPA) Scale – Trust/Avoidance Subscale

The parental attachment to child variable was assessed using the trust/avoidance subscale from the Revised – Inventory of Parent Attachment (R-IPA; Johnson et al., 2003). The Inventory of Parent and Peer Attachment (IPPA) was a scale created to measure adolescents' perception of the parent-child attachment relationship by Armsden and Greenberg in 1987. Johnson and colleagues (2003) desired to create a scale (R-IPA) that could be used in conjunction with this which would measure parents' perceptions of the parent-child attachment relationship to their adolescent children, which would thereby capture a more bi-directional measure of the parent-child attachment relationship when used alongside the IPPA. Current research using the R-IPA

scale has followed this procedure, using the R-IPA to measure the parents' perception and the IPPA to measure the adolescents' perception in families with adolescents (e.g.., Johnson, Ketring, Rohacs, & Brewer, 2006; Shlafer & Poehlmann, 2010). However, for the purposes of this study, younger-aged parents who mostly had younger-aged children were examined. To the researcher's knowledge, research has not yet produced a self-report scale that measures parents' perception of their attachment relationship with their young child (see Ravitz, et al., 2010 for a current review of adult attachment measures), apart from the R-IPA and a scale that measures mother's separation anxiety from their child. As such, the R-IPA, which measures parents' perception of their attachment relationship with their adolescent, was utilized with some modifications to instead measure parents' perception of their attachment relationship with their young children. Additionally, because young children are assumed to not be old enough to adequately complete the IPPA, the R-IPA in this study was not be completed alongside the IPPA.

The R-IPA was originally comprised of 30 questions. However, after a factor analysis indicated that only 22 items measured two factors of trust/avoidance and communication, the scale was reduced to 22 questions. This scale measures the frequency with which parent attachment scripts of trust/avoidance and communication are played out between the parent and child (Johnson et al., 2003). The trust/avoidance subscale contains 16 questions and obtained a Cronbach's alpha of .91 in the original study, indicating high internal consistency (Johnson et al., 2003). In a later study, this subscale obtained a Cronbach's alpha of .76, indicating a moderate internal consistency (Johnson et al., 2006). The communication subscale contains 6 questions and obtained a Cronbach's alpha of .72 in the original study and a .84 in a later study, indicating a moderate level of internal consistency (Johnson et al., 2003; Johnson et al., 2006). It should be noted that "convergent validity analyses revealed that trust/avoidance subscale correlated significantly with outside measures related to attachment, whereas the communication factor did not" (Johnson et al., 2006, p. 209). However, when the total score was used in the Shlafer and Poehlmann study (2010), the Cronbach's alpha for the R-IPA was .87 at time 1 and .91 at time 2.

The trust/avoidance subscale was the only subscale used for this study. The communication subscale was excluded, as many of this subscale's questions were geared towards parents who had children with advanced levels of communication. Again, because this

study is looking at younger-aged parents who had mostly younger-aged children, these questions would not have applied to these parents' experiences and so this subscale was not utilized.

A higher score on the R-IPA is indicative of positive parent-child relationship from the parents' perception (Shlafer & Poehlmann, 2010). Therefore, several items on the R-IPA trust/avoidance subscale were reverse coded. The items include the following statements: "I wish I had a different child," "My child expects too much of me," "I get upset easily around my child," "I feel angry with my child," "I don't get much attention or credit from my child," "I get frustrated with my child," "I don't like being around my child," and "I am constantly yelling and fighting with my child."

Let it also be noted that the current subscale used to measure attachment (trust/avoidance subscale R-IPA) does not explicitly interpret which scores might be associated with which of the four main types of attachment. However, it is implied in its use of measuring based on trust that higher scores capture a more secure attachment and lower scores depict an insecure attachment.

The R-IPA scale uses a 5-point Likert scale to measure the parent's perception of how true various attachment script statements are for them in relation to their child: 1 (almost never or never true), 2 (not very often true), 3 (sometimes true), 4 (often true), and 5 (almost always or always true). Survey questions from the trust/avoidance subscale includes statements such as "I feel my child is good," "I wish I had a different child," and "I get upset easily around my child." Questions from the communication subscale includes statements such as "If my child knows something is bothering me, she/he asks me about it" and "I tell my child about my problems." Because the R-IPA was originally designed for parents of adolescent children, some questions, particularly questions from the communication subscale, may not be applicable to parents with young children. As such, a "not applicable" option was added to the Likert scale.

Moreover, in this scale's instructions, it asks that the parent think about and rate the statements based on their relationship with their most problematic child. This specifier was removed and instruction that parents rate the statements based on their relationship with their oldest child was added. In this way, it allowed the data to be collected on parents' perceptions of the child that would best honor the scales' original intention to study parents with adolescent-aged children. Parents rated the other parenting scale, TIPS, based on this same, oldest child in order to increase reliability of the data.

Data Analysis

A mediation model was used to analyze the data, as this research examines the extent to which technology interference in parent-child interactions accounts for the relationship between problematic smartphone use and parent attachment to child. Baron and Kenny (1986) note that a mediation model examines the direct impact of the independent variable on the outcome variables and the impact of the independent variable on the mediator, so problematic smartphone use was also explored to see if there was a direct impact on the dependent variable of parental attachment to child as well as the mediating variable of smartphone interference in parenting. To test for mediation, the following regressions were run: first, problematic smartphone use was regressed on smartphone interference. Second, a hierarchical regression, in which the first step included problematic smartphone use and control variables as independent variables and parental attachment to child as the dependent variable. In the second step, parental smartphone interference was added to the model as an independent variable. For both regressions, control variables were gender, income, stress level, educational level, race/ethnicity, depression, anxiety, and the age of the child that the parent chose to focus on for the survey. The control variable of gender ultimately was divided into "man" and "woman." Race/ethnicity was divided into five categories – White/Caucasian, African American, Hispanic/Latino, Native/American Indian, and Multiracial/multiethnic. In the analyses, the White/Caucasian variable was used as a reference category against the other race/ethnicity variables.

CHAPTER 4: RESULTS

Data Screening

Data were collected from an online survey administered via MTurk. A total of 398 participants started the survey, with 31 participants being excluded from the survey for not completing it. A total of 358 participants completed the survey. Two-hundred twenty-six of those participants were excluded, with 166 participants excluded for either not consenting to participate or not meeting survey requirements of being between the ages of 18-29 years old, owning a smartphone, being a parent or legal guardian of a child under the age of 18, having contact with their child for 20 hours or more each week, and living in the United States. An additional sixty participants were then excluded for missing data or refusing to answer survey questions. It should be noted that for each scale used in the survey, participants had to complete at least 3/4 of each scale in order for them to not be removed for refusing to answer scale questions. This left 132 participants' responses remaining to be analyzed.

Data were downloaded, screened, and analyzed using the IBM Statistical Package for the Social Sciences (SPSS) – Version 26 software program. Frequencies and descriptives were run initially to screen data and explore demographic information. In order to screen for data, the following procedures were completed based on Tabachnick and Fidell's (2013) methods: a) check univariate descriptive statistics for out-of-bounds data, unusual means or standard deviations, and univariate outliers, b) check the amount and distributions of missing data, c) calculate skewness and kurtosis diagnostics on continuous scales, d) check pairwise plots of continuous scales for linearity and homoscedasticity, e) check for multivariate normality of continuous scales, and f) check for absence of multicollinearity and singularity of continuous scales.

After completing the data screening, it was found that no variables demonstrated kurtosis, but some variables did demonstrate skewness, limited to education level, child's age, and stress level. Despite this finding, no variables were transformed given that this sample is comprised of young parents and this skewness is expected. Furthermore, all continuous variables were linear, but the child's age variable did appear to violate an assumption of homoscedasticity. Again, this was expected given the sample of young parents with mostly young children. No singularity or

multicollinearity was found amongst the variables. However, one bivariate correlation between anxiety and depression approached multicollinearity at $r = .893$. Six multivariate outliers appeared to be present but were not dropped from the analysis as their responses appeared to be reasonable.

Demographics

Participants ranged in age from 21 to 29 years old with a mean age of 26.00 years (SD=2.40). Amongst participants, 0.8% were 21 years old, 9.8% were 22 years old, 9.1% were 23 years old, 9.8% were 24 years old, 12.9% were 25 years old, 11.4% were 26 years old, 11.4% were 27 years old, 12.9% were 28 years old, and 22.0% were 29 years old (see Table 1). The distribution between the participants' gender was exactly equal, with 50.0% identifying as men and 50.0% identifying as women (see Table 2). With regard to race/ethnicity, more of the sample identified as Caucasian/White (57.6%), with others identifying as African American (8.3%), Asian (15.2%), Hispanic/Latino (6.1%), Native/American Indian (4.5%) and Multiracial/multiethnic (8.3%) (see Table 3).

Table 1. Parent's Age ($n = 132$)

Age (in years)	Frequency	Percentage
18 – 20	0	0.0%
21 – 23	26	19.7%
24 – 26	45	34.1%
27 – 29	61	46.2%

Table 2. Parent's Gender ($n = 132$)

Gender	Frequency	Percentage
Man	66	50.0%
Woman	66	50.0%
Other	0	0.0%

Table 3. Parent's Race/Ethnicity (*n* = 132)

Race/Ethnicity	Frequency	Percentage
African American	11	8.3%
Asian	20	15.2%
Caucasian/White	76	57.6%
Hispanic/Latino	8	6.1%
Native/American Indian	6	4.5%
Multiracial/Multiethnic	11	8.3%

Participants also reported on income and education levels. The majority of participants (78.8%) made $30,000 or more annually (see Table 4). Most (85.6%) also obtained at least an Associate's, Bachelor's or Master's degree (see Table 5), indicating a well-educated sample.

Table 4. Parent's Yearly Income Level (*n* = 132)

Income Level	Frequency	Percentage
$0 - $14,999	7	5.3%
$15,000 - $29,999	21	15.9%
$30,000 - $44,999	28	21.2%
$45,000 - $59,999	32	24.2%
$60,000 - $74,999	24	18.2%
$75,000 and higher	20	15.2%

Table 5. Parent's Education Level (*n* = 132)

Education Level	Frequency	Percentage
Some high school	0	0.0%
High school graduate	5	3.8%
Some college	14	10.6%
Associate's degree	11	8.3%
Bachelor's degree	90	68.2%
Master's degree	12	9.1%
Doctoral or Professional Degree	0	0.0%

Furthermore, participants were questioned about their stress, depression, and anxiety levels. Most of the sample perceived high stress in their lives, with 75.1% reporting such (see Table 6). In regard to depression, there was a possible minimum of 2 and a possible maximum of 10 on the depression subscale of the adult version for the DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure. It should be noted that the original subscale actually has a possible minimum of 0 and a possible maximum of 8, but due to the way the survey was set up when using this measure, the possible minimum became 2 and the possible maximum became 10. In this survey, "none - not at all" was listed as "1" and "severe – nearly every day" was listed as "5", but in the original subscale, "none - not at all" was listed as "0" and "severe – nearly every day" was listed as "4." Amongst participants in this sample, there was a mean total depression score of 5.62 ($SD = 2.71$) (see Table 7). Additionally, with a possible minimum of 3 and a possible maximum of 15 for the anxiety subscale from the DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure, there was a mean total anxiety score of 8.30 ($SD = 3.92$) amongst participants (see Table 7). Again, it should be noted that due to the setup of the survey when using this measure, the possible minimum for this survey's subscale is different from the original survey's possible minimum (0) and possible maximum (12). This was due to the survey setup mentioned previously where "none - not at all" was listed as "1" and "severe – nearly every day" was listed as "5" for this survey. However, in the original subscale, "none - not at all" was listed as "0" and "severe – nearly every day" was listed as "4."

Table 6. Parent's Perceived Stress Level ($n = 132$)

Parent's Perceived Stress Scale Total Score	Frequency	Percentage
0-13 (low stress)	6	4.5%
14-26 (moderate stress)	27	20.4%
27-40 (high stress)	99	75.1%

Table 7. Parent's Total Depression and Anxiety Scores (*n* = 132)

	Possible Minimum	Possible Maximum	Observed Minimum	Observed Maximum	Mean	SD
Parent's Total Depression and Score	2	10	2	10	5.62	2.71
Parent's Total Anxiety Score	3	15	3	15	8.30	3.92

Other background data on the participants revealed that the majority of participants (94.7%) reported that they currently lived with a partner or spouse (see Table 9). Furthermore, 66.7% reported had only one child, 22.7% had 2 children, 6.1% had 3 children, 1.5% had 4 children, and 3% chose not to report how many children they had (see Table 10). Participants chose their oldest child to focus on during the survey. According to participants, the child they focused on ranged in age between 0 and 17, with the average age being 5.36 years (*SD* = 3.68) (see Table 8). It should be noted that participants were between the ages of 18 and 29 years but still might have reported that they had a child who would be considered an adolescent due to the possible explanations that follow. The criterion that required that participants identify as parents also allowed for participants to be considered "legal guardians". As such, older siblings may have taken on a parenting role as a legal guardian. Additionally, participants might be young step-parents to older-aged children. Finally, some participants might have become parents as an adolescent.

Table 8. Child's Age (*n* = 132)

Child's Age (in years)	Frequency	Percentage
Less than 1 – 2	29	22.0%
3 – 5	53	40.2%
6 – 8	26	19.7%
9 – 11	15	11.4%
12 – 14	4	3.0%
15 – 17	5	3.8%

Table 9. Participants who Live with Spouse/Partner (*n* = 132)

	Frequency	Percentage
Participants who Live with Spouse/Partner	125	94.7%
Participants who Don't Live with Spouse/Partner	7	5.3%

Table 10. Number of Children that Participants Have (*n* = 132)

Number of Children Participants Have	Frequency	Percentage
1	88	66.7%
2	30	22.7%
3	8	6.1%
4	2	1.5%
Chose not to answer	4	3%

Participants reported using their smartphones in various ways. These purposes included for work and/or school, entertainment (i.e. games, movies, videos, podcasts, music/radio, sports scores, etc.) social media, looking up information regarding parenting, household, health, etc., online shopping, getting directions, and recommendations or information based on the participant's location. See Table 11 below for further information about cellphone uses. Four participants self-reported using it for "other purposes" which included responses such as "share my data," "news," "livestreaming for work," and "club." Two participants responded with

"death." However, it is unclear what was meant by that. Additional qualitative questions would have been beneficial to further understand these responses, as they seemed to be serious responses given that their other responses to other questions seemed to also be serious responses.

Table 11. Purposes for which Participants Use their Smartphones (*n* = 132) (percentage)

	Never	Rarely	Sometimes	Often	All of the time	Chose not to answer
Work and/or School	5.3%	6.8%	32.6%	31.1%	22.0%	2.3%
Entertainment (i.e. games, movies, videos, podcast, music/radio, sports scores, etc.)	0.8%	7.6%	29.5%	39.4%	21.2%	1.5%
Social Media	1.5%	5.3%	23.5%	36.4%	29.5%	3.0%
Communicating with others (i.e. calling, texting, video calling)	0.8%	3.8%	22.0%	35.6%	34.1%	3.0%
Looking up information regarding parenting, household, health, etc.	0.8%	9.1%	25.0%	38.6%	24.2%	2.3%
Online shopping	3.8%	9.8%	34.8%	29.5%	18.9%	2.3%
Getting directions, recommendations, or info based on your location	2.3%	9.1%	25.0%	39.4%	22.0%	1.5%

Instrumentation

Several instruments were used to measure variables in this study, including the 10-item Perceived Stress Scale, the depression and anxiety subscales from the adult version of the DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure, the Problematic Use of Mobile Phones (PUMP) scale, the Technology Interference in Parenting Scale (TIPS), and the trust/avoidance subscale from the Revised – Inventory of Parent Attachment (R-IPA). Details and descriptive statistics of the instruments are found in Table 12.

Table 12. The Instruments and Descriptive Statistics

Scales	# of items	Theoretical Range	Observed Range	N	Mean	Standard Deviation	Reported Cronbach's Alpha	Cronbach's Alpha for This Study
Problematic Use of Mobile Phone (PUMP) scale	20	20 – 100	20 – 100	132	67.56	20.11	.94	.96
Technology Interference in Parenting Scale (TIPS)	13	13 – 65	13 – 65	132	39.49	14.76	.90	.97
Trust/ Avoidance subscale from Revised – Inventory of Parent Attachment (R-IPA)	16	16 – 80	23 – 80	132	56.74	12.05	.76 - .91	.90
Perceived Stress Scale-10 (PSS-10)	10	10 – 50	10 – 42	132	28.30	6.47	.86-.89	.73
Anxiety subscale from DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure	3	3 – 15	3 – 15	132	8.30	3.92	Data Unavailable	.93
Depression subscale from DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure	2	2 – 10	2 – 10	132	5.62	2.71	Data Unavailable	.87

Correlations

Pearson correlations were run amongst continuous variables to investigate relationships between variables (see Table 13). Parent attachment to child was significantly correlated with problematic smartphone use ($r = -.603$, $p < .01$), smartphone interference in parenting ($r = -.603$, $p < .01$), depression ($r = -.640$, $p < .01$), anxiety ($r = -.692$, $p < .01$), stress ($r = -.669$, $p < .01$), and income ($r = -.276$, $p < .01$),. Problematic smartphone use was also significantly correlated with smartphone interference in parenting ($r = .550$, $p < .01$), depression ($r = .619$, $p < .01$), anxiety ($r = .604$, $p < .01$), stress ($r = .574$, $p < .01$), and income ($r = .306$, $p < .01$). Moreover, smartphone interference in parenting had a significant relationship with depression ($r = .536$, $p < .01$), anxiety ($r = .547$, $p < .01$), as well as with stress ($r = .467$, $p < .01$) and income ($r = .217$, $p < .05$). Depression had a significant relationship with anxiety, $r = .893$, $p < .01$. Depression also was significantly correlated with stress ($r = .608$, $p < .01$) and income ($r = .196$, $p < .05$). Anxiety and stress were significantly correlated, $r = .622$, $p < .01$, as was anxiety and income, $r = .221$, $p < .05$. Education level was significantly correlated with income, $r = .221$, $p < .05$). The correlation between income and the age of the child reported on in the study approached significance at $r = .166$, $p = .057$.

Table 13. Correlations

	1	2	3	4	5	6	7	8	9
1. Income	-	.166	.087	-.070	-.021	-.074	-.028	.100	.221*
2. Child's Age	-	-	.084	.052	.036	-.113	-.110	-.115	-.115
3. Trust/Avoidance Subscale from R-IPA	-	-	-	-.603**	-.603**	-.640**	-.692**	-.669**	-.276**
4. PUMP	-	-	-	-	.550**	.619**	.604**	.574**	.306**
5. TIPS	-	-	-	-	-	.536**	.547**	.467**	.217*
6. Depression subscale from DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure	-	-	-	-	-	-	.893**	.608**	.196*
7. Anxiety subscale from DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure	-	-	-	-	-	-	-	.622**	.221*
8. PSS-10	-	-	-	-	-	-	-	-	.247**
9. Education Level	-	-	-	-	-	-	-	-	-

* Denotes significance at $p < .05$ (2-tailed)
**Denotes significance at $p < .01$ (2-tailed)

Analysis of Research Questions

In this analysis, both a multiple regression and a hierarchical regression were run to address if smartphone interference in parenting mediates the relationship between problematic smartphone use and parental attachment to child. In order to address Hypothesis 1, a multiple regression was run. In this analysis, problematic smartphone usage along with the control variables were regressed on smartphone interference in parenting. The control variables included gender, income, education level, child's age, stress level, race, depression, and anxiety. The regression indicated that the model was significant, F (13, 118) = 6.152, $p < .01$. This suggests that problematic smartphone use and the control variables reliably predict smartphone interference in parenting. The correlation coefficient between the predictors and the outcome variable was $R = .636$ with an *adjusted R^2* value of .404. This reveals that problematic smartphone use, when paired with the control variables, account for 40.4% of the variance in smartphone interference in parenting.

In order to address Hypotheses 2 and 3, a hierarchical regression was run. In the first step, problematic smartphone use and the control variables (gender, income, education level, child's age, stress level, race, depression and anxiety) were added to the model as independent variables and parental attachment to child was added to the model as the dependent variable. In the second step, parental smartphone interference was added to the model as an independent variable.

At the first step of the analysis, the regression model was found to be significant, F (13, 118) = 16.141, $p < .01$, thereby suggesting that the independent (problematic smartphone use) and control variables (depression, anxiety, gender, race, child's age, stress level, income, education level) do reliably predict parental attachment to child in this sample. The correlation coefficient between the predictors and the outcome was $R = .800$ with an *adjusted R^2* value of .640. This suggests that 64.0% of the variance in parental attachment to child is explained by the predictors (depression, anxiety, gender, race, child's age, stress level, income, education level, problematic smartphone use).

At the second step of the analysis, the regression model remained significant, F (14, 117) = 15.213, $p < .01$. When parental smartphone interference is added to the model, the variance in parental attachment to child explained by the predictors slightly increases to 60.3% ($R = .803$, *adjusted R^2 = .603*).

Hypothesis 1

Hypothesis 1 stated that problematic smartphone use would be positively related to smartphone interference. In order to test this hypothesis, the aforementioned multiple regression analysis was performed, with problematic smartphone use serving as the independent variable and smartphone interference in parenting as the dependent variable. Control variables were included in the analysis and included race, gender, income education level, stress level, age of child, anxiety, and depression. Statistical significance was found for the independent variable of problematic smartphone use ($t = 2.624$, $p < .01$) (see Table 14), thereby supporting Hypothesis 1's statement that a positive association between problematic smartphone use and smartphone interference in parenting exists.

Table 14. Multiple Regression Analysis Examining Problematic Smartphone Use and other Control Variables on Smartphone Interference in Parenting[a]

Predictors	B	Std. Error	Beta	t	p
Constant	2.498	8.064		.310	.757
Problematic Smartphone Use	.220	.076	.272	2.624	.010*
Gender	.928	2.255	.033	.436	.664
Income	-.248	.800	-.024	-.310	.757
Education Level	.737	1.298	.046	.568	.571
Child's Age	.377	.317	.094	1.187	.237
Perceived Stress	.252	.228	.110	1.103	.272
Race/Ethnicity – African American	-1.368	3.975	-.026	-.344	.731
Race/Ethnicity - Asian	.358	3.239	.009	.110	.912
Race/Ethnicity – Hispanic/Latino	3.094	4.638	.050	.667	.506
Race/Ethnicity – Native/American Indian	6.039	5.162	.086	1.170	.244
Race/Ethnicity – Multiracial/Multiethnic	3.865	4.002	.073	.966	.336
Depression	.454	.918	.083	.495	.621
Anxiety	.855	.623	.227	1.372	.173

a. Dependent Variable: Smartphone Interference in Parenting

*p < .05

Hypothesis 2

Hypothesis 2 stated that problematic smartphone use would be negatively related to parental attachment to child. This relationship was predicted to lose its significance when smartphone interference in parenting was added to the model. This hypothesis was tested using the hierarchical regression analysis mentioned previously in this paper. In the first step, problematic smartphone use (independent variable), parental attachment to child (dependent

variable), and gender, income, race, education level, stress level, child's age, depression, and anxiety (control variables) were entered into the model. In the second step, technology interference in parenting was added alongside these variables. The results did not yield support for this hypothesis. The correlation between problematic smartphone use and parental attachment to child was statistically significant in the first step of the analysis before smartphone interference in parenting was added to the model ($t = -.100$, $p < .05$) (see Table 15.) Once smartphone interference in parenting was added to the model, the relationship between smartphone interference in parenting and parental attachment to child lost significance ($t = -1.705$, $p > .05$). However, smartphone interference in parenting did not have a significant relationship with parental attachment to child ($t = -1.331$, $p > .05$), thus not supporting this hypothesis.

Hypothesis 3

Hypothesis 3 stated that smartphone interference in parenting would be negatively related to parental attachment to child. This hypothesis utilized the same data analysis procedure as Hypothesis 2. The relationship between smartphone interference in parenting and parental attachment to child was not found to be statistically significant ($t = -1.331$, $p > .05$), hence not supporting Hypothesis 3 (see Table 15).

Table 15. Hierarchical Regression Analysis Examining Problematic Smartphone Use and other Control Variables on Parental Attachment to Child[a]

Predictors	B	Std. Error	Beta	t	p
Regression Model 1					
(Constant)	88.261	5.114		17.260	.000
Problematic Smartphone Use	-.100	.048	-.167	-2.069	.041
Gender	2.735	1.430	.114	1.912	.058
Income	1.100	.507	.132	2.169	.032*
Education Level	-1.174	.823	-.090	-1.426	.156
Child's Age	.000	.201	.000	-.002	.999
Perceived Stress	-.684	.145	-.367	-4.728	.000***
Race/Ethnicity – African American	2.412	2.521	.056	.957	.341
Race/Ethnicity - Asian	-1.820	2.054	-.054	-.886	.377
Race/Ethnicity – Hispanic/Latino	-.769	2.941	-.015	-.262	.794
Race/Ethnicity – Native/American Indian	-6.369	3.273	-.111	-1.954	.053
Race/Ethnicity – Multiracial/Multiethnic	.735	2.538	.017	.290	.773
Depression	.404	.582	.091	.695	.488
Anxiety	-1.219	.395	-.396	-3.085	.003**
Regression Model 2					
(Constant)	88.455	5.099		17.347	.000
Problematic Smartphone Use	-.084	.050	-.141	-1.705	.091
Gender	2.811	1.427	.117	1.970	.051
Income	1.081	.506	.130	2.138	.035
Child's Age	.029	.202	.009	.143	.887

Table 15. Continued

Perceived Stress	-.665	.145	-.357	-4.584	.000***
Race/Ethnicity – African American	2.306	2.514	.053	.917	.361
Race/Ethnicity - Asian	-1.792	2.047	-.054	-.875	.383
Race/Ethnicity – Hispanic/Latino	-.529	2.937	-.011	-.180	.857
Race/Ethnicity – Native/American Indian	-5.928	3.281	-.103	-1.807	.073
Race/Ethnicity – Multiracial/Multiethnic	1.035	2.540	.024	.407	.684
Depression	.440	.581	.099	.757	.450
Anxiety	-1.153	.397	-.375	-2.904	.004**
Smartphone Interference in Parenting	-.077	.058	-.095	-1.331	.186

a. Dependent Variable: Parental Attachment to Child

*p < .05, **p < .01, ***p < .001

Conclusion

Following the completion of the data analyses, the results found support for the first hypothesis but not the second and third hypotheses. This suggests that problematic smartphone usage and smartphone interference in parenting do have a positive statistically significant relationship. It also reveals that problematic smartphone usage has a negative statistically significant relationship with parent attachment to child but that smartphone interference in parenting does not mediate this relationship. Additionally, smartphone interference in parenting does not seem to have a statistically significant relationship with parent attachment to child.

The analyses also explored the relationships of eight control variables with the dependent variable. The first analysis used to test Hypothesis 1 did not produce any statistically significant relationships with the dependent variable of smartphone interference in parenting and control

variables of gender, income, stress, education level, race, depression, anxiety, and child's age. However, the second analysis used to test Hypotheses 2 and 3 did find statistically significant relationships amongst a few of the control variables of income, stress, and anxiety and the dependent variable of parental attachment to child. In the first step of this second analysis, the t-value for income was 2.169 at $p < .05$. The t-value for stress was -4.728 at $p < .001$, and the t-value for anxiety was -3.085 at $p < .01$. Upon adding smartphone interference to the model, the t-values decreased to 2.138 at $p < .05$ for income, -4.584 at $p < .001$ for stress, and -2.904 for anxiety at $p < .001$. Hence, income is positively associated with parental attachment to child while stress and anxiety are negatively associated with parental attachment to child.

CHAPTER 5: DISCUSSION

The purpose of this study was to examine the interaction between problematic smartphone use, smartphone interference in parenting, and parental attachment to child. More specifically, it focused on whether smartphone interference in parenting served as a mediator between problematic smartphone use and parental attachment to child. Research on problematic smartphone use, technology interference, and attachment theory was integrated into a framework that guided the current research. This discussion examines the results for this study and explores possible explanations to their existence. Strengths, limitations, clinical applications and directions for future research are addressed.

Hypotheses

This study answered the research question: does smartphone interference in parenting mediate the relationship between problematic smartphone use and parental attachment to child? The following hypotheses were tested to answer the question and ultimately concluded that smartphone interference in parenting did not mediate the relationship between problematic smartphone use and parental attachment to child.

Hypothesis 1

Hypothesis 1 predicted that problematic smartphone use would be positively related to smartphone interference and found support for this hypothesis. The results from this research suggest that the greater the degree of reported problematic smartphone use, the greater the reported smartphone interference. This is similar to other findings by McDaniel and Radesky (2018), who examined the impact of technology that included more than just smartphones but found that parents' self-reported problematic digital technology in parent-child interactions predicted greater self-report of technology interference. Furthermore, our current findings are sensible because smartphones often serve as a limitless source of distraction (Chatton, 2017; Johnson, 2017; Kushlev, 2015). Therefore, if individuals who score high in terms of problematic smartphone usage are also reporting frequent instances of distraction on the PUMP scale such as "my smartphone keeps me from doing other important work" or "I have ignored the people I'm

with in order to use my smartphone," then it makes sense that this distraction bleeds into other areas of the participants' lives by way of interruptions when parenting.

Hypothesis 2

Hypothesis 2 stated that problematic smartphone use would be negatively related to parental attachment to child and would lose significance when smartphone interference in parenting was added to the model. This hypothesis was not supported. Although the relationship between problematic smartphone use and parental attachment to child did lose its significance when smartphone interference in parenting was added to the model, smartphone interference did not demonstrate significance in its relationship with parental attachment to child. This, thereby, suggests that it is not because of smartphone interference that the relationship between problematic smartphone use and perceived parental attachment to child lost significance. Reasons for the non-significant relationship between smartphone interference and parental attachment to child are further discussed under Hypothesis 3.

Nevertheless, it is beneficial to note that problematic smartphone use was found to be significantly negatively related to perceptions of parental attachment before smartphone interference was added to the regression model. In other words, participants who reported more problematic smartphone use perceived lower levels of attachment to their child. This is supported in attachment-related research findings that suggest that parents who use smartphones feel less connected to their children, have decreased engagement with their children, fail to respond to their children's bids for attention and respond negatively to their children when cell phone use was interrupted (Chatton, 2017; Kushlev, 2015; Radesky et al., 2014; Radesky et al., 2015; Radesky et al., 2016).

Hypothesis 3

Hypothesis 3 predicted that smartphone interference in parenting would be negatively related to parental attachment to child. However, the findings from this study discovered no significant relationship between smartphone interference and parental attachment to child. This finding is surprising given that research on parents distracted by screens in the presence of their children was associated with decreased responsivity, which is an aspect of the attachment relationship (Blackman, 2015). Additionally, Radesky and colleagues (2014) observed parents

who were distracted by their cell phones during a mealtime and noted decreased sensitivity and the display of behaviors that might indicate rejection toward the child, which also are aspects that have negative implications for the parent-child attachment relationship.

A possible explanation for this finding is that it comes as a result of using self-report methods and participants' perception to measure these variables. Perhaps parents do not accurately perceive the frequency of interruptions in parenting or have different ideas of what an "interruption" is. For example, maybe parents might consider only a long stretch of time of disengagement from their child with their smartphone to be "interference" and not necessarily a brief two-minute scroll through a social media site on their device. Additionally, perhaps parents perceive their parent-child attachment relationship to be positive, when their child might not necessarily agree with that if they had the words and cognitive capacity to do so. Essentially, perception can sometimes differ from reality, and this may be the case for why support was not found for this hypothesis.

Control Variables

There were some significant findings amongst parental attachment to child and income, stress, and anxiety.

First, income was positively related to parental attachment to child. In essence, participants who reported higher income levels also perceived greater levels of attachment to their child. Other research has examined the relationship between income and attachment and find similar supports for this study's finding. For example, Rawatlal, Pillay, and Kliewer (2015) found that higher household income levels were related to less anxious caregiver-adolescent attachment relationships. They also found that low household income was significantly related to anxious parent-adolescent attachment. Other research that looked at socioeconomic status (SES), measured as parents' income and education level, found that mothers were more responsive (which is an aspect of attachment) toward their children if they had reported a high-SES status (Gulseven et al., 2018). Indeed, parents with lower SES were more likely to be stressed, which was related to less sensitivity and responsiveness toward their children (Emmen et al., 2013), which infers that SES and stress were related to lower levels of attachment.

This finding regarding SES, stress, and attachment then draws attention back to this current study's finding that stress was negatively related to parental attachment to child. In

essence, the parents that reported higher perceived stress levels also perceived lower levels of attachment. This finding has been supported in other studies. For example, among children and their parents, Jarvis and Creasey (1991) found a significant association between 18-month old infants' insecure attachment to their parents and their parents' reported stress. Furthermore, A meta-analytic review by Groh and Narayan (2019) illustrated the biobehavioral effects of stress (in terms of cortisol and respiratory sinus arrhythmia) on attachment, reporting that early attachment insecurity in young children was associated with increased physiological reactivity to interpersonal stress with their parents. Additionally, amongst an adult sample, those with anxious attachment were more likely to report higher perceived stress (Fuenfhausen & Cashwell, 2013).

Lastly this study found that anxiety was negatively related to parents' perceived attachment to child. In other words, the more anxious symptoms they reported, the more likely they were to also report that they were less attached to their child. Research performed with a sample of children also found similar results, with the study also finding that attachment was related to symptoms of anxiety, and that, more specifically, children with anxious attachment styles were more likely to report symptoms of anxiety (Chorot, Valiente, Magaz, Santed, & Sandin, 2017). Another study also found that greater anxiety symptoms amongst parents with young children predicted that the parents reported less secure base interactions with their child (River, Borelli, & Nelson-Coffey, 2016). Additionally, River and colleagues (2016) found that anxiety symptoms helped predict if parents possessed an insecure attachment to their romantic partner.

Clinical Implications

As technology continuously becomes even more integrated into people's lives and as parents who grew up in this technology-immersed world have children, the researchers predict that society will begin seeing more and more of the intergenerational effects of smartphones and other technology within families. This study has demonstrated that there are associations between parents' problematic smartphone use and their perceptions of their attachment to their child as well as problematic smartphone use and smartphone interference in various areas of parenting. Consequently, it is important for clinicians to be aware of the research on the impact that smartphones can have on family relationships and family functioning.

Likely, parents and/or families will come to therapy complaining of children's behavioral problems and clinicians will need to further explore the role of technology, especially smartphones, in this occurrence. For example, are children "acting out" in certain instances because they are trying to get the attention of their smartphone-distracted parents? Are children not feeling important in their interactions with their parents because their parents are using their smartphones in problematic ways in their presence? Additionally, parents and families may present to therapy with another issue, but spouses/partners or children may make comments about parents' smartphone usage (e.g. "My mom/dad is always on their phone when we get home from school"), which might allow clinicians to investigate the extent to which smartphones contribute to the family's patterns of dysfunction. In order to do so, clinicians will need to assess the extent of problematic smartphone usage and can use the PUMP scale used in this study to do so.

Clinicians would also benefit from observing the extent to which the smartphone interferes in family functioning, especially with respect to its influences on parenting. Are parents frequently using their phone in session or even in the lobby while waiting for the therapy session to begin? Are therapists noticing children making bids for attention from their parents and parents missing these cues due to engagement in their smartphones? Additionally, clinicians could gather information in initial screening procedures of therapy that measure the quality of the parent-child attachment relationship by utilizing the R-IPA and IPPA (if the child is an adolescent) in conjunction with observations of the parent-child relationship in session.

Undoubtedly, clinicians will also need a framework to use in treatment of families whose structure has been altered by these handheld, ultraportable devices. Because a feedback loop is created in which family structure influences how families function and then how families function then influence the family structure (Johnson, 1971), clinicians need a framework that helps alter dysfunctional structure and processes within the family. The CFT framework was mentioned earlier in this paper and is an ideal framework to implement in order to navigate this process.

Using the CFT framework, the ecological elements of smartphones that might be of particular interest to clinicians would be that of acceptability, accessibility and accommodation. Clinicians might aim to change structure by exploring issues of acceptability such as rules around how much use is considered "too much" within the family and when it is acceptable to

use smartphones, especially when interacting with children. Acceptability can also be explored by guiding the family to explore the acceptable role of smartphones within the family. For example, how can they be used to channel intimacy and closeness (e.g. watching a funny video together, learning a dance or a magic trick together via videos accessed from the smartphone, etc.)? Accessibility can be explored by guiding families to identify how they can monitor access to smartphones when they are identified as problematic. For example, should smartphones be left in a different room when the family is eating dinner together, thereby limiting access and fostering positive family interactions? Accommodation can be explored by helping families seek to understand how smartphones play a role in their family dynamics and interactions and then setting structure around this role. For example, perhaps the parent plays games on their smartphone to de-stress from work, so this role is accommodated by allowing the parent a certain amount of time to do so before engaging in parenting responsibilities. The therapist can also help foster discussion to then help the family set rules and boundaries around what they have discovered.

Clinicians might also consider the integration of emotionally focused family therapy (EFFT) into their therapy with parents and children who appear to have an insecure parent-child attachment relationship. In this therapy, the goal is to cultivate secure attachment by fostering positive cycles of interaction around attachment features such as accessibility and responsiveness (Johnson, 1996). This would enable families to achieve a healthy level of functioning.

Another consideration for clinical implications is that this study found a correlation between anxiety and problematic smartphone use, so it would be helpful for therapists to examine the role that smartphones might play in managing anxiety. For example, do clients use their smartphone more when they are in anxious situations? They then might, again, use the CFT framework to alter structure and process according to this situation.

Limitations and Strengths

The researchers noted several limitations in the study. First, this study collected data that was self-reported and therefore, may have affected the accuracy of the results, as participants do not always report accurate information (Wright, 2006). This inaccuracy may perhaps be due to inaccuracies in participants' perception of their experiences. In fact, a third-party observer may have rated the participants differently on the various scales than what the participants rated for

themselves. An inaccuracy in perception might possibly be due to desire to adhere to societal expectations or pressures to be "good". For example, most parents want others to see them as "good parents" (Pew Research Center, 2015). As such, some participants may have over- or underreported the extent of problematic smartphone use, smartphone interference in parenting or parental attachment to child in order to be perceived as "good parents" by the researchers. Furthermore, shame, guilt, or denial may affect the accuracy of these results. For example, discussing parents' attachment scripts regarding their children may be considered a sensitive matter. Some parents may feel shame, guilt, or denial for having certain negative feelings, thoughts or actions toward their children (e.g. "I don't like being around my child" or "I am constantly yelling and fighting with my child" from the R-IPA scale) and, as such, not provide an accurate response.

Another limitation to this study is in regard to the generalizability of the sample. The survey for this study required internet access in order to search mTurk, elect to participate in this study's survey listed on mTurk, and then complete it. This may have affected the representation in the sample because differences in access in terms of both reported use and ownership of at-home broadband services varies based on demographics such as race, income, education, and community type (see Pew Research Center, 2019). Indeed, this may be why this current sample showed a majority of mostly college educated participants.

While also a strength (which will be further discussed later in this section), the equal split of participants based on gender may have caused a limitation to this study in terms of the accuracy of the results, especially based on responses to the Technology Interference in Parenting Scale. While it is true that men have become increasingly involved in caring for their children than in previous eras, women still spend more time caring for children (Pew Research Center, 2013). As such, when parents answered questions pertaining to which areas of parenting (e.g. getting child ready for day, naptime, bedtime, changing diapers, spending time with child not including feeding, changing or play, etc.) were interrupted with smartphones, more men may have reported less smartphone interference simply because they are less frequently involved in certain areas of parenting at all and not because they are using their smartphones less.

Moreover, this study produced results that were correlations, which means that causality and directional flow of the variables cannot be assumed. In addition, it is also possible that other variables not included in this study may be what actually account for the relationships between

problematic smartphone use, smartphone interference in parenting, and parental attachment to child.

Lastly, this study utilized the trust/avoidance subscale from the Revised Inventory of Parent Attachment. As previously mentioned, the scale was designed to be used with parents of adolescents and in conjunction with the IPPA in order to measure both perspectives of the parent-child relationship (Johnson, 2003). However, this current study used it on parents of mostly younger-aged children and not in conjunction with the IPPA as originally designed. This is a limitation because it only captures the parents' view of the parent-child attachment relationship, which is biased towards one person's perspective and does not fully capture the parent-child attachment relationship as intended. Moreover, a number of participants selected "choose not to answer" or "not applicable" to questions on this subscale. This is likely to the fact that certain situations or scenarios, which accurately represent the parent-child relationship with parents of adolescents, did not apply to parent-child relationships for parents of younger-aged children. Additionally, only the trust/avoidance subscale was used to operationally define parent-attachment in this study when the original scale utilized both the trust/avoidance and communication subscales. The communication subscale, as mentioned previously, was excluded due to the likelihood of most statements not applying to young parents who also most likely had young children. Because of this exclusion, perhaps parent-child attachment was not captured accurately. This then may have affected results from this study by not accurately portraying the parent-child attachment relationship in the way that the original scale intended.

While this study has many limitations, it also has strengths. As mentioned previously, generalizability may have been affected by the recruitment of participants via mTurk, which required both internet access and technology use. However, it should also be recognized that this method of data collection may also be a strength because this study focused on smartphones and is, therefore, technology-related. As such, the data collection method used was a good fit for this study's sample, as it shows that participants have integrated technology into their lives. It insinuates that participants have enough experience with technology to report on.

Additionally, it was also mentioned that the equal distribution of gender among participants was a limitation, but it is also a strength. Because of this equal distribution, it ensured that both men and women's perspectives related to this study were equally represented and reflected demographics of a larger population accurately.

The diversity of race/ethnicity identification in this sample was also a strength. In fact, the majority of racial/ethnic identification data for this study were similar to or more diverse than the racial/identification data for the U.S. population according to estimates from the U.S. Census Bureau (2018). The U.S. Census Bureau (2018) estimated 60.4% of the population are non-Hispanic/Latino White, 13.4% are African American or Black, 5.0% are Asian, 18.3% are Hispanic/Latino, 1.3% are American Indian/Alaskan Native, and 2.7% are two or more races. In this study, 57.6% were Caucasian/White, 8.3% were African American, 15.2% were Asian, 6.1% were Hispanic/Latino, 4.5% were Native/American Indian, and 8.3% were multiracial/multiethnic.

Furthermore, Cohen (1992) recommended a sample size of 107 participants for the regression analyses to harness sufficient statistical power. This study exceeded this requirement by having a sample size of 132 participants after data screening procedures were applied, thereby helping to guarantee statistical significance of the study's findings.

Moreover, the regression analyses produced models that were significant. This means that the model accurately represented the data and is helpful in making future predictions regarding problematic smartphone use, smartphone interference in parenting, and parental attachment to child.

Last, to this researchers' knowledge, this study was the first of its kind to examine attachment to young children from the parent's perspective. A large body of attachment research examines children's attachment relationship with their parents (e.g. Ainsworth et al., 1978; Bowlby, 1988; Main & Solomon, 1990; Waters et al., 1989; Weinfield et al., 2008), and a small number of studies have looked at parents' perceived attachment to their adolescent children (e.g. Johnson et al., 2003; Johnson et al., 2006; Shlafer & Poehlmann, 2010). However, research has lacked the parent's perspective of attachment to children of young ages. Because of the sample's young age, the majority of their children also had young ages, with the average age being 5.36 years. Therefore, this study provides attachment information on a sample that has not previously been studied to the researchers' knowledge.

Future Research

Although it is recognized that this study has contributed information regarding problematic smartphone use, smartphone interference in parenting, and parental attachment to child, it has also produced further questions that warrant future research.

Firstly, this study was based on participants' self-reports about their problematic smartphone use, smartphone interference in parenting, and parental attachment to child. Because participants may be biased towards answering questions in a way that would allow them to be perceived in a positive light, adding another scale in which the participants' partners also answered questions about their perceptions of the participants' experiences may help produce more reliable information on what actually occurs.

Additionally, this study utilized an attachment scale that measured the parents' perception of their attachment relationship with their child. According to the researchers' knowledge, this is the only self-report scale that does so from the parents' perspective. Nonetheless, the scale was designed for parents of adolescent children. Attachment-focused research would benefit from the development of a scale that captures parents' perspective on attachment to their young children as well. This would be helpful to the field, as it allows researchers to understand the parents' perspective, a perspective which is minimized in research but is needed in order to provide further direction for clinical implications.

Furthermore, this research focused specifically on smartphones. Other technological devices though, such as computers, laptops, televisions, gaming consoles, etc. should be examined in future research for their associations with parent-child attachment relationships. Similarities and differences in these findings can be compared with the findings of this study that report on only smartphones.

Moreover, this research found a bivariate correlation between anxiety and problematic smartphone use. Future research should further investigate this relationship to examine the role that smartphones play in managing anxiety for a sample in which problematic smartphone use is high. Future analyses might explore if smartphones mediate this relationship between anxiety and problematic smartphone use.

Lastly, this study collected information from a sample of young-aged individuals. Future research should consider the investigation of these variables amongst a sample with a larger range in ages. Doing so would allow for researchers to compare results across age groups that

grew up and developed habits with technology that may vary based on the decade in which they were born. This might help illustrate further the degree of impact that technology can have on families based on how immersed they are, assuming that technology has become more integral to younger age groups and produces increased immersion among them.

Conclusion

Smartphones have becoming increasingly integral in daily life, including into the lives of parents. The study aimed to examine the familiar effects of this by exploring the relationships between problematic smartphone use, smartphone interference in parenting, and parental attachment to child. More specifically, this research explored how smartphone interference in parenting might mediate the relationship between problematic smartphone use and parental attachment to child and found that it did not. As the results showed, problematic smartphone interference was significantly positively related to smartphone interference in parenting and significantly negatively related to parental attachment to child. Smartphone interference was not significantly related to parental attachment to child, but the control variables of income, stress, and anxiety did show significant associations with it.

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APPENDIX A. INFORMED CONSENT

RESEARCH PARTICIPANT CONSENT FORM Effects of Problematic Smartphone Use, Smartphone Interference in Parenting, and Parental Attachment to Their Young Child Dr. Anne B. Edwards and Chanelle M. Johnson Department of Behavioral Sciences Purdue University

What is the purpose of this study? You are being asked to participate in a study designed by Dr. Anne B. Edwards and Chanelle M. Johnson of Purdue University. We want to understand some of the experience(s) you have had with your smartphone and parenting as well as your experience(s) concerning the relationship with your child.

What will I do if I choose to be in this study? If you choose to participate, you acknowledge that you own a smartphone, are between the ages of 18 and 29 years, are a parent or legal guardian of at least one child under the age of 18 years, and have 20 hours or more of contact with this child each week. You will be asked to complete a survey asking about your smartphone use experience(s). You will also complete questions about your experience(s) concerning the relationship with your child. You are free not to answer any particular questions if they make you feel uncomfortable. You may also withdraw your participation at any time without penalty.

How long will I be in the study? The survey should take approximately 20 minutes to complete.

What are the possible risks or discomforts? Breach of confidentiality is a risk. To minimize this risk, only the researchers listed above will access the data from this study, and no personally identifying information will be collected during the study. The questions may also make you feel uncomfortable and may result in emotional distress. You can go to aamft.org or therapists.psychologytoday.com to find someone to speak to about any distress that may come due to participating in this survey.

Are there potential benefits? You will not directly benefit from this study. You will have a chance to take part in research, and your participation may, thus, contribute to the scientific understanding about parental smartphone use and their relationship with their child.

Will I receive payment or other incentive? You will receive payment of 40 cents for participating in this research project, so long as you meet the study inclusion criteria, you

complete all relevant questions in the survey, and you complete the appropriate verification question to ensure your active participation.

Will information about me and my participation be kept confidential? There is no personally identifying information on this survey; all responses will remain anonymous and will be used only in combination with the responses of other participants in this and related studies. Additionally, you may choose not to answer particular questions or to withdraw your participation at any time without penalty. All data gathered in this study will be accessed by the researchers. The data file will be used for preparation of research reports related to this study and kept for a period of three years after publication of any articles related to this study. The project's research records may be reviewed by departments at Purdue University responsible for regulatory and research oversight. In addition, IP addresses will not be linked to identifying information.

What are my rights if I take part in this study? Your participation in this study is voluntary. You may choose not to participate, and if you agree to participate, you can withdraw your participation before the data is gathered at any time without penalty or loss of benefits to which you are otherwise entitled.

Who can I contact if I have questions about the study? If you have questions, comments, or concerns about this research project, you can talk to one of the researchers. Please contact Dr. Anne B. Edwards at abedwards@pnw.edu or Chanelle M. Johnson at john2009@pnw.edu. If you have questions about your rights while taking part in the study or have concerns about the treatment of research participants, please call the Human Research Protection Program at (765) 494-5942, email (irb@purdue.edu), or write to: Human Research Protection Program - Purdue University Ernest C. Young Hall, Room 1032 155 S. Grant St., West Lafayette, IN 47907-2114

Documentation of Informed Consent I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research study, and my questions have been answered. I am prepared to participate in the research study described above. I certify that I own a smartphone, am between the ages of 18 and 29 years, am a parent or legal guardian of at least one child under the age of 18 years, have 20 hours or more of contact with this child each week, and agree to participate in this study.

- o   Yes, I have read the informed consent and choose to participate in this survey. (1)

- o   No, I choose not to participate in this survey (2)

Skip To: End of Survey If RESEARCH PARTICIPANT CONSENT FORM Effects of Problematic Smartphone Use, Smartphone Interference... = No, I choose not to participate in this survey

APPENDIX B. SURVEY

Parent_Age How old are you?

▼ Younger than 18 (1) ... I choose not to answer (15)

Skip To: End of Survey If How old are you? = Younger than 18
Skip To: End of Survey If How old are you? = Older than 29
Skip To: End of Survey If How old are you? = I choose not to answer

Own_SP Do you own a smartphone (a mobile phone device that offers internet access)?
  o   Yes (1)
  o   No (2)
  o   I choose not to answer (3)

Skip To: End of Survey If Do you own a smartphone (a mobile phone device that offers internet access)?
= No
Skip To: End of Survey If Do you own a smartphone (a mobile phone device that offers internet access)?
= I choose not to answer

Parent_of_child18 Are you a parent or legal guardian of at least one child under the age of 18?
  o   Yes (1)
  o   No (2)
  o   I choose not to answer (3)

Skip To: End of Survey If Are you a parent or legal guardian of at least one child under the age of
18? != Yes
Skip To: End of Survey If Are you a parent or legal guardian of at least one child under the age of 18? = I
choose not to answer

Freq_Contact Do you have contact with your child for 20 hours or more each week?
  o   Yes (1)
  o   No (2)
  o   I choose not to answer (3)

Skip To: End of Survey If Do you have contact with your child for 20 hours or more each week? != Yes
Skip To: End of Survey If Do you have contact with your child for 20 hours or more each week?(I choose
not to answer) Is Not Displayed
End of Block: Qualifiers

Start of Block: Demographics

Demo_Instructions Please respond to the following questions.

Gender What is the gender you identify with?
  o   Man (1)

    o   Woman (2)
    o   Other: (3) _____

Income What is your yearly income?
- $0 - $14,999 (1)
- $15,0000 - $29,999 (2)
- $30,000 - $44,999 (3)
- $45,000 - $59,999 (4)
- $60,000 - $74,999 (5)
- $75,000 and higher (6)
- I choose not to answer (7)

Race What race/ethnicity do you identify with? Check all that apply.
- African American (1)
- Asian (2)
- Pacific Islander (3)
- Asian Indian (4)
- Caucasian/White (5)
- Hispanic (6)
- Latino (7)
- Latina (8)
- Native/American Indian (9)
- Other (10) _____
- I choose not to answer (11)

Edu_Lvl What is your highest education level?
- Some high school (1)
- High school graduate (2)
- Some college (3)
- Associate's degree (4)
- Bachelor's degree (5)
- Master's degree (6)
- Doctoral or Professional degree (7)
- I choose not to answer (8)

Sp/P_Live Does a spouse/partner currently live with you?
- Yes (1)
- No (2)
- I choose not to answer (3)

SP_Use How often do you typically use your smartphone for the following purposes?

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	All of the time (5)	I choose not to answer (6)
Work and/or school (1)	○	○	○	○	○	○
Entertainment (i.e. games, movies, videos, podcast, music/radio, sports scores, etc.) (2)	○	○	○	○	○	○
Social media (3)	○	○	○	○	○	○
Communicating with others (i.e. calling, texting, video calling) (4)	○	○	○	○	○	○
Look up information regarding parenting, household, health, etc. (5)	○	○	○	○	○	○
Online shopping (6)	○	○	○	○	○	○
Get directions, recommendations, or info based on your location (7)	○	○	○	○	○	○
Other: (8)	○	○	○	○	○	○

#_Kids How many children do you have?
▼ 1 (1) ... I choose not to answer (11)

End of Block: Demographics

Start of Block: PUMP Scale

PUMP Please read each statement and choose one answer that tells how true the statement is for you.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)	I choose not to answer (6)
When I decrease the	○	○	○	○	○	○

amount of time spent using my smartphone I feel less satisfied. (1)						
When I stop using my smartphone, I get moody and irritable. (2)	○	○	○	○	○	○
The amount of time I spend using my smartphone keeps me from doing other important work. (3)	○	○	○	○	○	○
I think I might be spending too much time using my smartphone. (4)	○	○	○	○	○	○
When I am not using my smartphone, I am thinking about using it or planning the next time I can use it. (5)	○	○	○	○	○	○
I have ignored the people I'm with in order to use my smartphone. (6)	○	○	○	○	○	○
I have used my smartphone when I knew I should be sleeping. (7)	○	○	○	○	○	○
I have gotten into trouble at work or school because of my smartphone use. (8)	○	○	○	○	○	○

I have used my smartphone when I knew it was dangerous to do so. (9)	○	○	○	○	○	○
My smartphone use has caused me problems in a relationship. (10)	○	○	○	○	○	○
I need more time using my smartphone to feel satisfied than I used to need. (11)	○	○	○	○	○	○
It would be very difficult, emotionally, to give up my smartphone. (12)	○	○	○	○	○	○
I have thought in the past that it is not normal to spend as much time using a smartphone as I do. (13)	○	○	○	○	○	○
People tell me I spend too much time using my smartphone. (14)	○	○	○	○	○	○
I feel anxious if I have not received a call or message in some time. (15)	○	○	○	○	○	○
I have used my smartphone when I knew I should be	○	○	○	○	○	○

doing work/schoolwork. (16)	○	○	○	○	○	○
When I stop using my smartphone because it is interfering with my life, I usually return to it. (17)	○	○	○	○	○	○
At times, I find myself using my smartphone instead of spending time with people who are important to me and want to spend time with me. (18)	○	○	○	○	○	○
I have almost caused an accident because of my smartphone use. (19)	○	○	○	○	○	○
I have continued to use my smartphone even when someone asked me to stop. (20)	○	○	○	○	○	○

End of Block: PUMP Scale

Start of Block: Revised Inventory of Parent Attachment

RIPA instructions This part of the survey asks about your relationship with your **oldest** child. Please read each statement and choose ONE response that tells how true the statement is for you in regards to your oldest child.

Child_Age What is the age (in years) of the child you are focusing on?
▼ (1) ... I choose not to answer (19)

RIPA Please respond to the following statements according to the directions above.

	Almost never or never true (1)	Not very often true (2)	Sometimes true (3)	Often true (4)	Almost always or always true (5)	Not applicable (6)	I choose not to answer (7)
My child respects my feelings. (1)	○	○	○	○	○	○	○
I feel my child is good. (2)	○	○	○	○	○	○	○
I wish I had a different child. (3)	○	○	○	○	○	○	○
My child accepts me as I am. (4)	○	○	○	○	○	○	○
My child expects too much of me. (5)	○	○	○	○	○	○	○
I get upset easily around my child. (6)	○	○	○	○	○	○	○
When we discuss things, my child cares about my point of view. (7)	○	○	○	○	○	○	○
My child trusts my judgment. (8)	○	○	○	○	○	○	○
I feel angry with my child. (9)	○	○	○	○	○	○	○
I don't get much attention	○	○	○	○	○	○	○

or credit from my child. (10)							
My child understands me. (11)	○	○	○	○	○	○	○
When I am angry about something, my child often understands. (12)	○	○	○	○	○	○	○
I trust my child. (13)	○	○	○	○	○	○	○
I get frustrated with my child. (14)	○	○	○	○	○	○	○
I don't like being around my child. (15)	○	○	○	○	○	○	○
I am constantly yelling and fighting with my child. (16)	○	○	○	○	○	○	○
I like to get my child's point of view on things I am concerned about. (17)	○	○	○	○	○	○	○
My child can tell when I'm upset	○	○	○	○	○	○	○

about something. (18)							
I tell my child about my problems. (19)	○	○	○	○	○	○	○
I talk to my child about my difficulties. (20)	○	○	○	○	○	○	○
I can count on my child when I need to get something off my chest. (21)	○	○	○	○	○	○	○
If my child knows something is bothering me, she/he ask me about it. (22)	○	○	○	○	○	○	○

End of Block: Revised Inventory of Parent Attachment

Start of Block: Technology Interference in Parenting Scale

TIPS Think only about times when the following domains happened with your oldest child. How frequently has your smartphone use interfered with these aspects of parenting with your oldest child?

	0 (Never) (1)	1 (Rarely) (2)	2 (Sometimes) (3)	3 (Often) (4)	4 (Very often) (5)	I choose not to answer (6)
Playtime (1)	○	○	○	○	○	○
Spending time with child (NOT including feeding,	○	○	○	○	○	○

changing, or play) (2)						
Educational activities (e.g., reading books) (3)	○	○	○	○	○	○
Mealtime (4)	○	○	○	○	○	○
Bedtime (5)	○	○	○	○	○	○
Discipline/limit setting (6)	○	○	○	○	○	○
Getting child ready for day (7)	○	○	○	○	○	○
Shopping trips (8)	○	○	○	○	○	○
Naptime (9)	○	○	○	○	○	○
Bathtime (10)	○	○	○	○	○	○
Changing diapers (11)	○	○	○	○	○	○
Dressing (12)	○	○	○	○	○	○
Nighttime (13)	○	○	○	○	○	○

End of Block: Technology Interference in Parenting Scale

Start of Block: Perceived Stress Scale

Stress The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.

	Never (1)	Almost Never (2)	Sometimes (3)	Fairly Often (4)	Very Often (5)	I choose not to answer (6)
In the last month, how often have you been upset because of something that happened unexpectedly? (1)	○	○	○	○	○	○
In the last month, how often have you felt that you were unable to control the important	○	○	○	○	○	○

things in your life? (2)	○	○	○	○	○	○
In the last month, how often have you felt nervous and "stressed"? (3)	○	○	○	○	○	○
In the last month, how often have you felt confident about your ability to handler your personal problems? (4)	○	○	○	○	○	○
In the last month, how often have you felt that things were going your way? (5)	○	○	○	○	○	○
In the last month, how often have you found that you could not cope with all the things that you had to do? (6)	○	○	○	○	○	○
In the last month, how often have you been able to control irritations in your life? (7)	○	○	○	○	○	○
In the last month, how often have you felt that you were on	○	○	○	○	○	○

top of things? (8) In the last month, how often have you been angered because of things that were outside of your control? (9)	○	○	○	○	○	○
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? (10)	○	○	○	○	○	○

DEP The questions below ask about things that might have bothered you. For each question, choose the answer that best describes how much (or how often) you have been bothered by each problem during the past TWO (2) WEEKS.

	NONE - Not at all (1)	SLIGHT - Rare, less than a day or two (2)	MILD - Several days (3)	MODERATE - More than half the days (4)	SEVERE - Nearly every day (5)	I choose not to answer (6)
Little interest or pleasure in doing things? (1)	○	○	○	○	○	○
Feeling down, depressed, or hopeless? (2)	○	○	○	○	○	○

ANX The questions below ask about things that might have bothered you. For each question, choose the answer that best describes how much (or how often) you have been bothered by each problem during the past TWO (2) WEEKS.

	NONE - Not at all (1)	SLIGHT - Rare, less than a day or two (2)	MILD - Several days (3)	MODERATE - More than half the days (4)	SEVERE - Nearly every day (5)	I choose not to answer (6)
Feeling nervous, anxious, frightened, worried, or on edge? (1)	○	○	○	○	○	○
Feeling panic or being frightened? (2)	○	○	○	○	○	○
Avoiding situations that make you anxious? (3)	○	○	○	○	○	○

End of Block: DSM-5 Cross-Cutting Measure - Dep & Anxiety

Start of Block: End of Survey Thank You

Thx Thank you for your participation in this survey.

End of Block: End of Survey Thank You