Smartphones and Parent- Child Interactions: Texting Impacts Behaviors, But No Mere Presence Effect

Chehalis M. Strapp, Daisy M. Garibay Garibay, Addie M. Morrow, Ella M. Mainwaring, Ruth E. Simonsen, Mateo J. McCann, Saarah E. Johnson & Haven E. Pickup
Psychological Sciences Department, Western Oregon University

The purpose of this study was to examine changes in parent-child behaviors when the parent was interacting with a smartphone. Technoference or everyday interruptions from smartphone use may lead to lower levels of parent-child engagement. In some cases, the "mere presence" of a smartphone can interfere with interactions, even when the phone is not used. Using a repeated measures design, 30 parent-child dyads (Parents: 26 mothers, 4 fathers, M_{age} = 33.97 years, *SD* = 4.93; Children: 16 girls, 14 boys, M_{age} = 37.03 months, *SD* = 9.97) were videotaped interacting with toys across three conditions including a texting condition, where the parent received and responded to unpredictable text messages, a "mere presence" condition where parents expected to receive text messages, but did not, and a no phone condition where the phone was turned off and out of sight. Videotapes of the dyads were coded for parent and child behaviors across the three conditions. As expected, parents were less responsive, less likely to scaffold their child's behavior, and engaged in less coordinated joint attention when texting compared to the no phone condition. Children produced more bids for attention when the parents were texting compared to no phone condition. The "mere presence" of a smartphone did not impact the parent or child's behavior, with responses resembling the no phone condition. These results suggest that actively using a smartphone compromises parent and child behaviors, but the mere presence of the phone does not.

INTRODUCTION

Smartphones have become integral to our daily lives. Approximately 90% of Americans own a smartphone with other countries showing similar adoption rates (South Korea, 98%; Germany 86%; UK 86%; Israel 85%; Poushter et al., 2024). People use smartphones to talk, text, or interact through social media, check and respond to emails, work, listen to music, read, watch movies, play video games, etc. (McDaniel, 2019). Smartphones are distinct from other digital devices like laptops and tablets

Author info: Correspondence should be sent to Chehalis M. Strapp, Ph.D.
Email: strappc@wou.edu

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because of their portability and their pervasiveness. For example, 90% of people report that they carry their smartphones throughout the day (Rainie & Zickuhr, 2015) and check their phones 12 times an hour or about 186 times each day (Wheelright, 2026).

Smartphone usage is a common feature of modern parenting seen in 95% of homes with young children (Rideout, 2017). Parents rely on smartphones to meet work and childcare obligations, access parenting information, receive social support, and provide an escape from the demands or boredom of parenting (Radesky et al., 2016; Torres et al., 2021) and parents spend about 4 hours a day on their smartphones (Yuan et al., 2019) or about 27% of the time that they are with their child (McDaniel et al., 2023). Given the high rate of parental smartphone use around children, there is growing concern that smartphones may compromise parent-child interactions and children's development (Anderson & Hanson, 2017; Knitter & Zemp, 2020; Toledo-Vargas et al., 2025). The term "technoference" refers to distractions and disruptions in interactions caused by technology or smartphone use (McDaniel & Coyne, 2016; Vanden Abeele et al., 2020). In the current paper, we explore how parent technoference in the form of texting and the "mere presence" of a smartphone impact parent and child behaviors. First, we review how smartphones influence parent-child interactions. Next, we summarize research examining technoference and parent-child behaviors. Finally, we outline our predictions and describe an experiment to assess the impact of technoference on parent-child behaviors.

Smartphones and Parent-Child Interactions

There are several ways that smartphones affect parent-child interactions. Time spent on smartphones may displace or decrease meaningful parent-child interactions (McDaniel & Radesky, 2018). For example, observational studies show parents initiate fewer verbal and nonverbal interactions when using a phone (Lemish et al., 2019; Vanden Abeele et al., 2020). Smartphones create a "distractional conflict" dividing attention between what is happening elsewhere (e.g., on social media) and the present moment (Misra et al., 2016). Smartphones may distract parents from noticing a child's bids for attention and responding promptly (Abels et al., 2018; Radesky et al., 2014). Parents may not realize how smartphones impact their attention - they lack absorption awareness and may not hear or see a child seeking attention while on the device (Radesky et al., 2014). This may be related to how parents use smartphones. For example, a parent talking on the phone may be able to maintain eye contact and joint attention with a child more so than a parent texting or scrolling on a phone (Radesky et al., 2014). Finally, smartphones disrupt parent-child interactions (Frackowiak et al., 2024). Disruptions from audible notifications or text messages interfere with conversational turns and

require the parent to go in and out of the interaction (Konrad et al., 2021a). Since notifications can be received at any time, they are unpredictable in nature (Przybylski & Weinstein, 2012) and the receiver often feels compelled to respond quickly (Harmon & Mazmanian, 2013). We hope to explore how unpredictable texting interruptions influence parent-child interactions within this study.

Theoretical Framework

Quality parent-child interactions are integral to children's development of language and communication skills (Madigan et al., 2019; Vallotton et al., 2017). Parental sensitivity is crucial to quality parent-child interactions (Bornstein et al., 2008; Jeong et al., 2021). Sensitive parents detect and respond to a child's bids for attention; they follow the child's lead and adjust their behavior to meet the needs of the child. Technoference impacts parental sensitivity behaviors including responsiveness, joint attention, scaffolding, and directiveness (Braune-Krickau et al., 2021; Campi et al., 2025; Corkin et al., 2021; Lederer et al., 2021; Morris et al., 2022). Responsive parents provide timely, consistent, and contingent responses to a child's cues and bids for attention (Bornstein et al., 2008; Tamis-LeMonda et al., 2014). Parents may have trouble switching from paying attention to a device and being responsive to a child (Konrad et al., 2021b; Radesky et al., 2016). Joint attention occurs when the parent and child are paying attention to the same object of interest (Brooks & Meltzoff, 2015). This shared focus may be disrupted when parents' attention shifts from the child to the smartphone screen. Scaffolding occurs when a parent adjusts their behavior to support the child's current level of ability (Tamis-Le Monda et al., 2014). Effective scaffolding occurs most often when the parent is available and paying attention to the child (Biringen et al., 2000). Conversely, parents may become more directive and controlling when distracted by a smartphone. Directiveness may be a strategy that parents adopt when technoference leaves them less able to concentrate and interpret their child's cues appropriately (Radesky et al., 2016). Parents interacting with a smartphone might direct children to activities that require lower levels of parental involvement (Masur et al., 2005).

Technoference and Parent Behavior

Observational studies show caregivers interacting on a cellphone appear to be less responsive (Abels et al., 2018; Elias et al., 2021; Ewin et al., 2021a; Lemish et al., 2019; Radesky et al., 2014), they engage in less joint attention (Lemish et al., 2019; Ochoa et al., 2020), they provide less scaffolding (Lemish et al., 2019), and tend to be more directive when interacting with a child (Elias et al., 2021; Ewin et al., 2021a; Radesky et al., 2014). While these studies have high ecological validity since the caregiver is not likely to censor behavior (Vanden Abeele et al., 2020), the studies often make cross-sectional comparisons between caregivers using

a phone and those who do not. There could be systematic differences between caregivers who use a cellphone and those who do not also impacting behavior (Piotrowski & Valkenburg, 2015; Vanden Abeele et al., 2020), or associations may be bi-directional, such that less responsive caregivers may use their smartphones more, which may decrease their responsiveness (Tharner et al., 2022). Likewise, correlational studies show associations between technoference and parent behaviors (Corkin et al., 2021; Sundqvist et al., 2021; Tharner et al., 2022). For example, Corkin et al. (2021) found that mothers who received more audible notifications were less responsive, engaged in less scaffolding and were higher in directiveness when interacting with their 11-month-old infant compared to mothers who received fewer audible notifications, even when the smartphone was not present. While correlational studies provide insight into relationships between technoference and parent behaviors, experimental research is required to draw causal conclusions (Elias et al., 2021; McDaniel, 2019). To that end, experimental research shows that when parents interact with a smartphone, they are less responsive (Gaudreau et al., 2021; Konrad et al., 2021b; Krapf-Bar et al., 2022; Rothstein, 2018), engage in less joint attention (Ewin et al., 2021b; Krapf-Bar et al., 2022), and use less scaffolding (Rothstein, 2018) compared to a no smartphone/control condition- when the phone is not present. Technoference differed across studies, parents were asked to complete a survey on a smartphone (Konrad et al., 2021b; Gaudreau et al., 2021), review a Facebook page (Lederer et al., 2021), or respond to texted questions (Krapf-Bar et al., 2022). These studies also show that smartphones are not any more disruptive than nondigital distractions such as completing a paper and pencil survey (Konrad et al., 2021b; Gaudreau et al., 2021); or reading a magazine (Ewin et al., 2021b; Lederer et al., 2021). Some of the smartphone and nondigital distraction conditions required parents to work on a specific task (e.g., complete a survey on a phone or on paper; review a Facebook page or a print magazine) for a set period of time during which parents were free to go in and out of the distraction when they chose to do so. These distractions were not interactive or dialogical in nature (Lederer et al., 2021). Parents were distracted but not disrupted. Conversely, Krapf-Bar et al. (2022) found that unpredictable smartphone text messages were more disruptive to mother-child interactions than unpredictable social interruptions. Mothers were less responsive to their 11-month-old infants when they received random smartphone text messages, compared to mothers who received random social interruptions. This suggests that the unpredictable nature of some forms of technoference, specifically text messages, may be more disruptive to parent-child interactions than other forms of technoference (Ochoa et al., 2020).

Technoference and Child Behavior

Although most research has focused on parent behaviors during device use, children's reactions to technoference may alter parents' behavior (Ewin et al., 2021b). Several studies show children make more bids for attention when a caregiver is engaged with a smartphone compared to when a device is not present (Konrad et al., 2021b; Krapf-Bar et al., 2022; Lederer et al., 2021; Myruski et al., 2018; Radesky et al., 2014). Children may express frustration, anger, and withdrawal in response to parental device use (Radesky et al., 2014). For example, Konrad et al. (2021a) found 19-month-olds showed increased negative affect (e.g., crying) when a parent was disrupted by a text message compared to when not receiving text messages. Conversely, Konrad et al. (2021b) found 11-month-olds producing more positive bids for attention, the child tried to get the mother's attention by smiling when the mother was answering a survey on a smartphone compared to the no smartphone control condition. Finally, Rozenblatt-Perkal et al. (2022) found more signs of physiological and behavioral distress including increased heart rate and negative affect in 11-month-old infants when their mothers received text messages compared to a social interruption and free play condition. They concluded that texting interruptions may be stressful to young children. Combined, these results suggest that children's responses to technoference may depend on how the parent is engaged with the device. Children's responses to parent texting may differ from other types of parent device use.

The Mere Presence Effect

Even when not in use, smartphones may impact parent-child interactions. In an observational study of caregivers on a playground, Vanden Abeele et al. (2020) found that simply holding a phone, without using it, was associated with lower caregiver responsiveness relative to caregivers who were not holding a phone. This phenomenon has been referred to as the "mere presence" effect (Misra et al., 2016) and it implies that simply being around a smartphone, without using it, can influence behavior. The "mere presence" of a smartphone may activate relational networks, prompting people to think about what is happening with others elsewhere while reducing engagement and attention to the present (Przybylski & Weinstein, 2012). Gergen (2002) referred to this as the "absent presence," where one is physically and perceptually present but immersed in a technologically mediated world elsewhere. Smartphones may induce "brain drain" limiting attentional resources and cognitive capacity (Ward et al., 2017). Several studies show that "mere presence" of a smartphone, operationalized as a smartphone placed in view but not used, impacts adults' cognitive performance on complex tasks (Thornton et al., 2014; Ward et al., 2017) and the quality of their social interactions with other adults (Misra et al., 2016; Przybylski & Weinstein, 2012). Other

studies failed to find a "mere presence" effect in cognitive performance (Hartmann et al., 2020; Ruiz Pardo & Minda, 2022) and social interactions (Caplan & Courtright, 2024; Crowley et al., 2018; Linares & Sellier, 2021). Only two studies have examined the "mere presence" effect in adult-child interactions. As noted above, Vanden Abeele et al. (2020) found that simply holding a cellphone was related to lower caregiver responsiveness to the child. In contrast, an experimental study of mothers interacting with their 24–36-month-old toddlers, found no support for the "mere presence" effect (Lederer et al., 2021). In this study, Lederer et al. did not include a "mere presence" condition, but instead operationalized "mere presence" by examining periods when the mother was not actively reviewing a Facebook page on a smartphone for at least three seconds, compared to periods when the mother was not actively reading a magazine or during a no distraction free play condition. They found that mothers were not less responsive in these "mere presence" intervals than they were in the no distraction free play condition. It is important to note that neither study considered how the mere presence of a smartphone might impact child behavior. Young children may be particularly susceptible to distraction in the presence of a smartphone (Radesky & Christakis, 2016). In the current study, we aim to further explore how the "mere presence" of a smartphone, particularly when a parent anticipates receiving messages impacts parent and child behavior. Given the bidirectional nature of parent-child interactions, children may respond differently to parents in the presence of a smartphone, even if not used.

CURRENT STUDY

The potential impact of technoference on parent-child interactions is timely, given the high rates of parental smartphone use in the presence of children (McDaniel & Coyne, 2016; Vanden Abeele et al., 2020; Yuan et al., 2019). Additionally, there is limited knowledge about how the "mere presence" of a smartphone may impact parent and child behaviors (Lederer et al., 2021; Vanden Abeele et al., 2020). In the current study, we explored changes in parent-child behaviors when the parent was interacting with a smartphone. Using a repeated-measures design, we compared parent and child behavior across three conditions including a texting condition, a mere presence condition, and a no phone condition. In the texting condition, parents received and responded to text messages. Text messages are unpredictable disruptions that require the parent to go in and out of the interaction intermittently, closely resembling day to day interactions (Konrad et al., 2021a; Krapf-Bar et al., 2022). In the "mere presence" condition, the smartphone was present, and parents expected to receive text messages, but none were sent. Finally in the no phone condition, parents turned off the phone and put it out of sight. Based on prior research, we predicted that parents would be less responsive, show less coordinated

joint attention, and engage in less scaffolding in the texting condition compared to the no phone condition. Additionally, we expected parents to be more directive in the texting condition compared to the no phone condition. Given the limited research on how the "mere presence" of a smartphone impacts parental behaviors we anticipated that parent responsiveness, scaffolding, coordinated joint attention and directiveness would differ in the mere presence condition compared to texting and no phone conditions. We hypothesized that children would produce more bids for attention in the texting condition compared to the no phone condition, and if children are sensitive to changes in parent behaviors, we anticipated that children's bids for attention in the mere presence condition would differ relative to bids for attention in the texting and no phone conditions.

METHOD

Participants

The initial sample included 33 parent-child dyads who were conveniently sampled from childcare centers, preschools, libraries, and mothers' groups in the Monmouth, Independence, and Dallas, Oregon communities. Of the 33 dyads, 30 were included in the final sample. Two dyads were excluded because the parents did not turn on their phone during the texting condition and data for one dyad was not usable due to technical issues with the recording. The families in the final sample included 26 mothers and 4 fathers, who were between 25-46 years old (M = 33.97; SD = 4.93), relatively well-educated (60% had completed a bachelor's degree or higher), and predominantly Caucasian (77%), however, the sample also included parents who identified as Biracial Hispanic and Caucasian (10%), Biracial Asian and Caucasian (7%), Black (3%), and Hispanic (3%).

The children in the final sample included 16 girls and 14 boys, who were between 24-58 months old (M = 37.03; SD = 9.97). Children were predominantly Caucasian (74%), Biracial Hispanic and Caucasian (10%), Biracial Asian and Caucasian (10%), Biracial Asian and Hispanic (3%) and Black (3%). Parents reported that 10 of the children were regularly exposed to another language besides English including Spanish, American Sign Language (ASL), and Vietnamese in childcare, preschool, or interacting with a parent and/or grandparent, however all parents reported that English was the primary language used when interacting with their child. The parents received a $40 gift card from a vendor of choice (e.g., Amazon, Walmart, grocery store). The children received a small book, a certificate, and a sticker for participating. The Western Oregon University Institutional Review Board approved the study.

Design

A repeated-measures experimental design was used in the current study. Parent-child dyads were videotaped and audiotaped playing with a standard set of toys across three 5-minute conditions including a no phone

condition, a mere presence condition, and a texting condition. All families experienced all three of the conditions and the order of the conditions was counterbalanced across families in a pseudo-order such that the phone turned off/silenced condition was either first or last of the three conditions. Consistent with Lederer et al. (2021) we reasoned that turning the phone on and off would be more disruptive than the other conditions.

Materials

DISRUPT Scale

Parents completed a modified version of the Distraction in Social Relations and Use of Parent Technology (DISRUPT) scale (McDaniel, 2021). The DISRUPT scale includes four items to assess parental distraction with phones (e.g., I find it difficult to stay away from checking my phone or mobile device). Parents rate each item on a 6-point Likert Scale from Strong Disagree (1) to Strongly Agree (6) and a mean DISRUPT score is used to assess parental distraction with phones. Higher scores indicate higher levels of distraction from the cellphone. Pilot testing indicated that the first item on the scale "I find myself thinking about what I could be doing on or messages/notifications I might receive on my phone or mobile device" was better understood by parents when presented as two separate items "I find myself thinking about what I could be doing on my cellphone or mobile device" and "I find myself thinking about messages/notifications I might receive on my phone or mobile device." We presented these as separate items, creating a five-item version of the scale. Since the mean was used, values should be comparable to other uses of the DISRUPT Scale (Corkin et al., 2021; McDaniel, 2021).

Parental Notifications and Cellphone Use

Parents were asked five questions about their own cellphone usage when their child was awake. Questions were drawn from Corkin et al. (2021). Parents were asked three open-ended questions: estimating how often they received audible notifications, how often they checked their phone, and how many minutes they spent using their phone while their child was awake. Additionally, parents were asked to rate their response to two questions: a) How often do you have your cellphone in easy reach when spending time with your child? Parents responded on a 5-point scale (1 = all of the time; 2 = most of the time; 3 = half of the time; 4 = less than half of the time; 5 = hardly any of the time or never). Additionally, parents rated the item b) How often do you consciously decide to not use your cellphone when with your child and then turn it off and put it away for a while? Parents responded on a 5-point scale (1 = everyday; 2 = several times a week; 3 = once a week; 4 = once every two weeks; 5 = occasionally or never). Parents were asked to indicate NA if these items were not applicable.

Setting and Toys for Free Play

The experiment was conducted in a laboratory playroom on a university campus. Two video cameras (Lovpo 4K Video Camera Camcorder with external microphone) were placed on two different sides of the room to capture interactions. Additionally, a small audio recorder (SONY IC Recorder) was placed close to the interaction space to capture additional audio information. The playroom was designed to resemble a typical home environment that included a couch, a small table and chairs, and a shelf with cubbies containing age-appropriate toys consisting of Duplo building blocks, a shape sorting farm set, little people with vehicles, shape stackers, dinosaurs with colors and numbers, puzzles, stuffed animals, and books. Families were encouraged to play with any toys they preferred.

Procedure

Parents completed a consent form and provided demographic data online before coming into the lab for the experiment. Parents were invited to pick a time for the campus visit that best fit their schedule and were provided with a parking pass. Upon arrival, the researcher greeted families, and the parent completed an in-person consent process, and the child provided verbal assent to participate. Parents were told that we wanted to see if parent and child behavior changed in the presence of a cellphone, and we would be videotaping and audiotaping them interacting with their child across three 5-minute segments. Before each segment, we let them know if they should have their cellphone turned on for notifications or turned off. For the no phone condition, we asked the parent to turn off the volume/audible notifications on their cellphone and put the phone away out of sight. Before the first condition where they could receive messages, we verified the parent's cellphone number, we asked them to turn on audible notifications on their phone and told the parent that they may or may not receive text messages, and if they did, they should respond to them. Parents were given the same instructions for the mere presence and texting conditions, however for the mere presence condition, no messages were sent, and for the texting condition parents were sent 3 text messages at approximately 1:30, 2:30, and 4:00 within the 5-minute condition. The first message asked parents to rate the statement "My child is interested in the toys" on a 5-point scale from 1 = strongly disagree to 5 = strongly agree. The second text asked parents to answer an open-ended question "Do you think that smartphones have benefitted your child's learning? If so, how? Brief answers are ok." The third text asked parents to answer an open-ended question " What does your child enjoy doing on a smartphone? (e.g., watch videos, play games)? Short answers are ok." The messages were intended to disrupt the parent during the texting condition. We did not analyze the content of parent responses. For all conditions, we

encouraged the parent to play with their child as they would at home. After the directions, we turned on the cameras and audio recorder and left the playroom so the parent and child could interact without the researcher.

After the last condition, parents were sent a final text message with a link to a Qualtrics survey with the DISRUPT scale, and Parental Notifications and Cellphone Use questions. After answering these questions, families were debriefed and thanked for their participation.

Video Coding

Parental Behavior Coding & Behaviors Defined

We coded parent behaviors including responsiveness, scaffolding, coordinated joint attention, and directiveness using coding systems from prior research (Corkin et al., 2021). Behaviors were coded offline from the videotapes, and audio recordings were used when needed to verify video data. Behaviors were coded one at a time across all three conditions. First, two trained coders watched the videotape independently to familiarize themselves with the interaction. Then they watched the same segment at least 4 more times, each time focusing on one aspect of the coding scheme (e.g., responsiveness, scaffolding) and recorded their initial codes for each dimension. For each dimension they coded the first half of the condition and then the second half of the condition. Next the coders met and shared their codes and discussed reasons for assigning the codes. When scores did not agree, the coders together watched the segment in question and further discussed coding differences. When the final scores did not agree, their scores were averaged. This process was repeated for each condition and coded behavior resulting in final separate codes for the first half and second half of each 5-minute condition. The final scores assigned during the first and second half of the interactions were averaged, and these scores were used as the outcome variable for responsiveness, scaffolding, coordinated joint attention, and directiveness. Reliability of coding was based on initial codes independently assigned by each coder prior to discussion using the absolute intraclass correlation coefficient (ICC) method. Information about agreement for each parent behavior appears below.

Responsiveness includes parents showing awareness of the child's activities and cues, following the child's lead, and responding to the child in a timely manner (Corkin et al., 2021; Wilson & Durbin, 2013). Responsiveness was rated on a scale of 1 (Not responsive at all); 2 (Rarely responsive); 3 (Inconsistently responsive); 4 (Often responsive); 5 (Extremely responsive). ICC for the first half = .810, 95% CI = [.714, .912], second half ICC = .850, 95% CI = [.79, .96] - final averaged score ICC = .830. Scaffolding refers to parent behaviors that are related to the child's ability. In scaffolding, the parent adjusts their behavior and language based on the child's skill and provides feedback creating

opportunities to practice new skills (Carr & Pike, 2012; Corkin et al., 2021). Scaffolding was rated on a scale of 1 (Never scaffolds); 2 (Rarely scaffolds); 3 (Inconsistently scaffolds); 4 (Often scaffolds); 5 (Always scaffolds). ICC for the first half = .892, 95% CI = [.766, .950], second half ICC = .804, 95% CI = [.721, .905] - final averaged score ICC = .848. Coordinated Joint Attention (CJA) happens when the parent and child are interacting together, looking at, and playing with the same object of interest (Corkin et al., 2021). Coordinated joint attention was rated on a scale of 1 (Never engaged in CJA); 2 (Rarely engaged in CJA); 3 (Somewhat engaged in CJA); 4 (Often engaged in CJA); and 5 (Always engaged in CJA) ICC for the first half = .925, 95% CI = [.838, .965], second half ICC = .861, 95% CI = [.722, .933] - final averaged score ICC =.893. Directiveness occurs when the parent leads the interaction by telling the child with words or behaviors what the child should do (Corkin et al., 2021; Landry et al., 2000). Directiveness was rated on a scale of 1 (Not directive); 2 (Rarely directive); 3 (Inconsistently directive); 4 (Often directive); and 5 (Always directive). ICC for the first half = .771, 95% CI = [.606, .891], second half ICC =.809, 95% CI = [.801, .894] - final averaged score ICC =.79.

Child Behavior Coding & Behaviors Defined

We coded children's bids for attention using coding from prior research (Konrad et al., 2021b; Myruski et al., 2018; Ninio, 2015). Videos were coded offline first by one coder. The coder watched the video and noted bids for attention including time stamps on the video to indicate when the bid occurred, briefly described the bid, and coded each bid for emotional affect. A second coder independently watched the video and coded bids for attention. Then the two coders met and discussed codes and disagreements, watching the videotape again together to come to a consensus. Reliability of coding was based on initial codes assigned prior to discussion using the absolute intraclass correlation coefficient (ICC) method. Information about agreement for bids for attention appears below. Agreed upon codes were used for subsequent analysis.

A bid for attention was operationalized as any attempt by the child to get the parent's attention through vocal (e.g., words, "look") or behavioral means (e.g., pointing, looking at the parent and then the object). A key factor in coding included that the parent needed to not be attending to what the child was looking at or playing with at the time. If the child already had the parent's attention, and the child pointed to an object, that was not coded as a bid for attention. Bids for attention included words/verbalizations (e.g., child says hey, look see, or parent's name mom), other vocalizations (e.g., whining, crying, surprised tone); pointing (e.g., extending the index finger towards an object or person); showing (e.g., child raises the object toward the parent's face); touching (child puts

hand on parent); taking or giving (child takes object away from or gives to parent), gaze alteration (child looks at object, then parent, and then object) (Konrad et al., 2021b; Ninio, 2015). After identifying the bid, the coder was asked to determine the general affect of the bid. Bids were coded as either positive/neutral - or negative. Positive/neutral bids were coded when the child's bid included smiling, laughing, and positive/neutral tone of voice and facial expressions. Negative bids were coded when the child's bid included frowning, crying, whining, and negative tone of voice and facial expressions (Konrad et al., 2021b). ICC for coding children's bids for attention averaged .826, 95% CI = [.75, 1.00]. ICC for coding emotional affect of bid for attention averaged .962, 95% CI = [.88, 1.00]. The total number of bids for attention varied across families ranging from 0 to 29 total bids for attention (M = 7 bids, SD = 5.79, Mode = 6 bids). Negative bids for attention occurred infrequently with 70% of children producing no negative bids for attention. The remaining children (N = 9) produced 1 to 9 negative bids for attention across all the conditions (M = .87, SD = 1.83, Mode = 2 negative bids). We summed the positive/neutral bids with negative bids for attention and used total bids for attention as a dependent variable across the three conditions.

Statistical Analysis Plan

Hypothesis 1, given that parent behavior was rated on a 5-point ordinal scale for responsiveness, coordinated joint attention, scaffolding, and directiveness we used the Friedman test as a nonparametric alternative to the repeated-measures ANOVA. Friedman tests with the within-subject factor (no phone, mere presence, and texting) were conducted with parent responsiveness, coordinated joint attention, scaffolding, and directiveness. We followed up with post hoc analysis with a Wilcoxon signed-rank test with a Bonferroni correction applied, resulting in a significance set at $p < .017$.

Hypothesis 2, for children's bids for attention, ratio data, met assumptions for normality - therefore, we conducted one repeated-measure ANOVA with condition as the within-subject factor (no phone, mere presence, and texting) on children's total bids for attention. We followed pairwise comparisons with Bonferroni corrections.

RESULTS

Descriptive Analysis

DISRUPT Scale

On the DISRUPT Scale, parents averaged 3.98 (SD = .98), indicating they somewhat agree that the cellphone was a distraction (1 = Strongly disagree, 6 = Strongly agree).

Parental Notifications and Cellphone Use

Parents reported frequency of audible notifications, phone checking and time spent on their phone while their child was awake. Parents received audible notifications on average 3.4 times each per hour (*SD* = 3.5, Mode = 5, Range 0-15 times), they checked their phone on average 5 times per hour (*SD* = 4.23, Mode = 5, Range 1-20 times) and spent an average of 13.55 minutes per hour on their phone (*SD* = 6.88, Mode = 10, Range 2-30 minutes). When asked how often they have their cellphone in easy reach when spending time with their child, 20 out of 30 parents (66%) reported that their phone was with them almost all of the time or most of the time. The remaining parents reported that their cell phone was within easy reach half of the time (17%) or less than half of the time (17%). Parents reported that they decided to consciously not use their phone and put it away everyday (50%), several times a week (37%), once a week (10%), occasionally or never (3%).

Parental Behaviors Across Conditions

As predicted, there were significant differences in responsiveness ratings across the conditions Friedman test χ^2 (2) = 45.308, p < .001, with a large effect size (Kendall's W = 0.76). There were no differences in responsiveness between the no phone and mere presence condition (Z = .258, p = .796), however responsiveness differed between the no phone and texting condition (Z = 5.55, p < .001) and the mere presence and texting condition (Z = 5.29, p < .001). Additionally, there were significant differences in coordinated joint attention ratings across the conditions Friedman test χ^2 (2) = 45.945, p < .001 with a large effect size (Kendall's W = 0.77). There were no differences in coordinated joint attention between the no phone and mere presence condition (Z = 1.23, p = .220), however coordinated joint attention differed between the no phone and texting condition (Z = 6.13, p < .001) and the mere presence and texting condition (Z = 4.91, p < .001). Likewise, scaffolding ratings differed across the conditions Friedman test χ^2 (2) = 26.10, p < .001 with a moderate effect size (Kendall's W = 0.48). There were no differences in scaffolding between the no phone and mere presence condition (Z = .904, p = .366), however scaffolding differed between the no phone and texting condition (Z = 4.712, p < .001) and the mere presence and texting condition (Z = 3.81, p < .001). Conversely, there were no significant differences in directiveness ratings across the conditions Friedman test χ^2 (2) = 2.04, p = .362, with a small effect size (Kendall's W = 0.03). Median and interquartile range (IQR) ratings for parent behaviors by condition are displayed in Table 1.

Table 1
Median and Interquartile Range (IQR) for Parent Behaviors by Condition

	Condition		
Behavior	No Phone	Mere Presence	Texting
Responsive			
Median	4.90	4.80	3.50
IQR	4.45-5.00	4.50-5.00	3.18-4.00
CJA			
Median	4.77	4.50	3.17
IQR	4.50-5.00	3.95-5.00	2.72-3.67
Scaffold			
Median	4.05	4.24	3.25
IQR	3.50-4.60	3.51-4.60	2.75-3.75
Directive			
Median	2.88	2.50	2.50
IQR	2.19-3.50	2.19-3.00	2.00-3.16

Note. CJA = Coordinated Joint Attention

Children's Bids for Attention

As predicted, there were differences in bids for attention across the conditions $F(2, 58) = 20.52$, $p < .001$, Partial $\eta^2 = .414$. Pairwise comparisons with Bonferroni correction showed children produced fewer bids for attention in the no phone condition ($M = 1.03$, $SD = 1.56$) and the mere presence condition ($M = 1.33$, $SD = 1.81$) compared to the texting condition ($M = 4.87$, $SD = 4.49$) ($p < .001$). There were no differences in total bids for attention between the no phone ($M = 1.03$, $SD = 1.56$) and mere presence conditions ($M = 1.33$, $SD = 1.81$) ($p = .245$).

DISCUSSION

The current study explored changes in parent and child behaviors when the parent was interacting with a smartphone. Given the high rates of parent smartphone use in the presence of children (McDaniel & Coyne, 2016; Vanden Abeele et al., 2020) understanding the effects of technoference on parent-child interactions is timely. With respect to self-reported technoference and smartphone use, parents resembled caregivers in prior research (Corkin et al., 2021; McDaniel et al., 2023). On the

DISRUPT scale, parent scores indicate that they find it difficult to stay away from checking their phone. DISRUPT items are meant to capture cognitive saliency of mind wandering and thinking about their device, even if not using it (McDaniel, 2021). Additionally, parents reported that for each hour that they interacted with their child, they spent 14 minutes on their phone, they checked their phone about five times and received on average 3 audible notifications. Additionally, 67% of parents reported that their cellphone was in easy reach most or all the time when interacting with a child. Conversely, 87% of parents reported that at least several times a week they consciously did not use their phone and put it away when interacting with their child. These results suggest smartphone usage is common in parent-child interactions, parents are cognizant of smartphone distractions. However, the self-report responses may underestimate parent technoference. Parents may feel guilty about using a smartphone in the presence of their child and underreport usage (Radesky et al., 2016). Additionally estimates may be inaccurate since smartphone checking and receiving audible notifications are intermittent in nature and hard to recall (McDaniel, 2019). In fact, research using passive sensing- an app installed onto a smartphone to track real time use showed a strong underreporting bias in parents (Yuan et al., 2019). Unfortunately, parents may not be interested in using an app to track smartphone use. Konrad et al. (2021a) found that only 48% of the parents in their study were willing to use the passive sensing app. Future research should consider how best to accurately assess parent smartphone use in the context of parent-child interactions.

As predicted, when texting parents were less responsive, they showed lower coordinated joint attention and engaged in less scaffolding compared to when their phone was turned off and out of sight. These results add to a growing body of research showing that parents are less able to detect and respond to a child's bids for attention, they are less likely to follow the child's lead and adjust their behavior to meet the needs of the child when texting on a smartphone (Abels et al., 2018; Elias et al., 2021; Ewin et al., 2021a; Gaudreau et al., 2021; Konrad et al., 2021b; Krapf-Bar et al., 2022; Lemish et al., 2019; Ochoa et al., 2020; Radesky et al., 2014; Rothstein, 2018). As parent responsiveness, coordinated joint attention and scaffolding are key components of high-quality sensitive parenting (Braune-Krickau et al., 2021; Campi et al., 2025; Corkin et al., 2021) and related to development of language and communication skills (Brooks & Meltzoff, 2015; Madigan et al., 2019; Vallotton et al., 2017) these results are cause for concern. Parents who spend extensive time texting in the presence of their children may be compromising the child's communication and language skills (Corkin et al., 2021; Morris et al., 2022; Reed et al., 2017). While we do not know the long-term impact of

technoference on parent responsiveness, scaffolding, and coordinated joint attention, correlational and longitudinal research shows lower parental responsiveness (Brookman et al., 2023), lower joint attention (Campbell et al., 2007), and lower scaffolding (Hughes & Devine, 2019) related to poorer language outcomes in children. Additionally, intervention studies targeted to increase parental responsiveness (Frizelle et al., 2021), joint attention and scaffolding (Botting et al., 2024) find increases in children's vocabulary for 2, 3, and 4-year-olds when parents increase responsiveness, joint attention, and scaffolding.

Conversely, parents were not more directive when texting. In fact, low levels of parent directiveness were observed across all conditions. Several observational studies suggest that parents become more directive and controlling when distracted by a smartphone (Elias et al., 2021; Ewin et al., 2021a), they may be less capable of concentrating and interpreting their child's cues appropriately (Radesky et al., 2016) and may direct the child to activities that require lower levels of parental involvement (Masur et al., 2005). Caregivers in observational studies did not know they were being observed, while parents in the current experiment did. It is possible that parents in our study moderated this behavior to look like good parents (Abels et al., 2018; Vanden Abeele et al., 2020). Since parental directiveness is inversely related to parental sensitivity and typically associated with children's poor language skills (Tulviste & Tamm, 2023), additional research should consider if technoference impacts parent directiveness.

We did not observe a "mere presence" effect in this study. To our knowledge, this is the first experimental study examining parent-child interactions to have a "mere presence" condition instead of including it as part of a distraction condition (Lederer et al., 2021). Contrary to our prediction, even when parents expected to receive text messages, they behaved like they did in the no phone condition showing comparable levels of responsiveness, coordinated joint attention, and scaffolding. This suggests that simply having a smartphone in view and expecting to receive audible notifications did not impact parent behavior. Parents can ignore their smartphones when they need to do so. There is limited prior research on the "mere presence" effect in parent child interactions with conflicting results (Lederer et al., 2021; Vanden Abeele et al., 2020) and while some research finds that the "mere presence" of a smartphone impacts adult performance on cognitively complex tasks (Thornton et al., 2014; Ward et al., 2017) and in social interactions (Misra et al., 2016; Przybylski & Weinstein, 2012), several recent research failed to replicate these findings calling the "mere presence" effect into question (Crowley et al., 2018; Hartanto et al., 2024; Linares & Sellier, 2021; Parry, 2024). Recent researchers attribute inconsistencies to changes in social norms regarding

cellphone use (Crowley et al., 2018), and that smartphones are not as novel or distracting as they may have been in earlier studies (Linares & Sellier, 2021). Even studies using eye-tracking software show adult participants rarely looking at their smartphones while performing a task (Koessmeier & Buttner, 2022). Given that most parent-child interactions take place in the presence of a smartphone, more research is needed.

Children notice when parents are engaged with a smartphone. As in prior research, when parents were distracted by text messages, children attempted to regain their attention with words and behaviors (Konrad et al., 2021b; Krapf-Bar et al., 2022; Lederer et al., 2021; Myruski et al., 2018; Radesky et al., 2014). Children produced about five bids for attention on average in the 5-minute texting condition, and only about one bid in the no phone or mere presence conditions. Like parents, children were not distracted by the mere presence of a smartphone, and they behaved as if the phone was not present. Although most research has focused on parent behaviors during device use, children's reactions to technoference may alter parents' behavior (Ewin et al., 2021b). Children produced very few negative bids for attention. Children did not appear distressed or upset with bids for attention. Bids were overwhelmingly positive or neutral. While some prior research found children showing negative affect to parent technoference (Konrad et al., 2021a; Rozenblatt-Perkal et al., 2022) other studies showed more positive bids (Konrad et al, 2021b; Ochoa et al., 2020). It is possible that children in the current study showed positive or neutral affect to parent technoference because our conditions were short, and children were free to move about to interact with toys (Porter et al., 2023). Additionally, studies where children expressed negative affect to parent technoference examined children between 8 months to 19 months whereas the current study examined 2–4-year-old children. While the specific mechanism to explain children's bids for attention to parent technoference is unclear, as children develop social communication skills, they learn that communicative bids elicit specific outcomes from caregivers (Ninio, 2015) and notice when caregivers violate these norms (Gros-Louis et al., 2014). Infants as young as 2-months-old can detect changes in caregiver responsiveness (Bigelow & Power, 2014) and preschoolers actively attempt to re-establish caregiver attention with increased responses resembling an extinction burst (Konrad et al., 2021a; Porter et al., 2023). Certainly, more research should examine how children attempt to re-establish attention in response to parent smartphone use (Frackowiak et al., 2024).

Limitations

Our study has several limitations common to experimental research. Testing was done in a controlled laboratory setting on a university campus where the parent and child knew they were being videotaped limiting

ecological validity. Social desirability may have impacted parent behaviors (Vanden Abeele et al., 2020). Knowing they were part of a study may have influenced how parents responded to text messages and self-report measures of technoference. The sample size for the current study was small (N = 30 families), although comparable to other repeated measures studies (Ewin et al., 2021b; Inoue et al., 2022; Lederer et al., 2021). Characteristics of the sample further limit generalizability. Families were predominantly Caucasian (Parents 77%, Children 74%) and parents were well educated (60% had completed a bachelor's degree or higher). Smartphone use may be more disruptive to lower SES families who traditionally show lower interaction levels relative to higher SES families (Hart & Risley, 1995; Romeo et al., 2018). We used texting as technoference in the current study because prior research showed that unpredictable digital disruptions that require parents to go in and out of an interaction intermittently were most disruptive (Konrad et al., 2021a; Krapf-Bar et al., 2022), however we did not compare texting disruptions to other digital distractions (e.g., social media, gaming) or nondigital distractions or disruptions. Given that prior research shows parent and child behaviors also change when parents are engaged with nondigital distractions such as completing a paper and pencil survey (Gaudreau et al., 2021; Konrad et al., 2021b), looking at a magazine (Ewin et al., 2021b; Lederer et al., 2021) or responding to an unpredictable social interruption (Krapf-Bar et al., 2022; Rozenblatt-Perkal et al., 2022) we cannot conclude that texting was more disruptive than other forms of nondigital distractions. Finally, since we looked at parent and child reactions to brief instances of technoference (three text messages within 5 minutes), we cannot draw conclusions about longer instances of technoference or how prolonged smartphone use may impact parent-child interactions. We do not know if parents re-engage with children at higher levels after a smartphone disruption (Reed et al., 2017). Some observational research shows that following phone use, parents show increased engagement with the child (Linder et al., 2022). Future experimental research should explore how parent and child behavior may change during and after texting.

CONCLUSION

Notwithstanding the above limitations, the current study contributes to experimental research showing that parents become less responsive, are less likely to scaffold their child's behavior, and engage in less coordinated joint attention when they are texting but not in the mere presence of a smartphone. Children notice these changes and attempt to regain their parents' attention. Given the high rate of parental smartphone use in the presence of young children (McDaniel et al., 2023) and the importance of high-quality sensitive parenting to several developmental outcomes, concern is merited (Anderson & Hanson, 2017; Knitter & Zemp, 2020;

Toledo-Vargas et al., 2025). While extensive observational and correlational studies document parent technoference (Abels et al., 2018; Corkin et al., 2021; Elias et al., 2021; Ewin et al., 2021a; Lemish et al., 2019; Ochoa et al., 2020; Radesky et al., 2014; Sundqvist et al., 2021; Tharner et al., 2022) more experimental research is needed to draw causal conclusions about how smartphones impact parent-child interactions whether through device distraction, presence, or disruptions (Elias et al., 2021; Frackowiak et al., 2024; McDaniel, 2019) and how different types of device use (e.g., social media, gaming, health tracking, taking photos) may differentially impact parent-child interactions (McDaniel et al., 2025). Additionally, the field would benefit from more cross-cultural research as most studies include families sampled from the United States (Gaudreau et al., 2021; Hiniker et al., 2015; Reed et al., 2017), Europe (Abels et al., 2018; Vanden Abeele et al., 2020), Australia (Ewin et al., 2021a; Mangan et al., 2018) and New Zealand (Corkin et al., 2021; Moran, 2010) with a few exceptions (China: Jiang et al., 2024; Japan: Inoue et al., 2022; Isreal: Krapf-Bar et al., 2022; Lederer et al., 2021). Concerns about parent technoference may be more common in Western cultures, which emphasize "intensive parenting" and expect caregivers to create stimulating environments to promote child development (Hiniker et al., 2015). Unfortunately, the "dangers of parent technoference" has entered popular culture as accepted fact (Alaimo, 2025; Gray, 2025) and negative media coverage about parent phone use is common (Bueskens, 2023; Christakis, 2018; Lisickis, 2020). Denmark opened its first screen free playground to encourage parents to put away their phones (Nordic Times, 2026). Social norms regarding parent phone use are generally negative, leaving many parents feeling guilty about phone use (Hiniker et al., 2015; Wolfers et al., 2023). However, guiding parents to completely "unplug" when with their child is probably unrealistic given how smartphones are embedded in daily lives (Kildare & Middlemiss, 2017) and ignores the beneficial ways that parents use smartphones to connect with others, to alleviate stressors, to access parenting tips, to regulate mood, and to work from home (Radesky et al., 2016; Torres et al., 2021). Instead, we recommend providing evidence-based guidance for smartphone use sensitive to the lived experiences of parents (Kildare & Middlemiss, 2017; McDaniel et al., 2025) and then assessing the effectiveness of such guidelines without stigmatizing or blaming parents (Wolfers et al., 2023).

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Correspondence

Chehalis Strapp, Psychological Sciences Department, Western Oregon University, 345 Monmouth Ave N., Monmouth, OR 97361. Email: strappc@wou.edu

Credit author statement

Chehalis M. Strapp conceptualized and designed the study, coordinated and supervised data collection, conducted the initial analyses, drafted the initial manuscript, and reviewed and revised the manuscript.
Daisy M. Garibay Garibay provided feedback on the study design, coordinated parent and child coding, and reliability, and reviewed the manuscript.
Addie M. Morrow provided feedback on the study design, coded parent behaviors, assisted with data coordination, and provided feedback on the manuscript draft.
Ella M. Mainwairing coded parent and child behavior, assisted with data collection and analysis, and provided feedback to the manuscript.
Ruth E. Simonsen coded parent behavior and reviewed the manuscript,
Mateo J. McCann coded parent and child behavior and reviewed the manuscript.
Saarah E. Johnson provided feedback to the study design, coded parent, and child behavior, and reviewed the manuscript.
Haven E. Pickup provided feedback on the study design, assisted with data collection, and provided feedback on the manuscript.
All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

Declaration of competing interest

None

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Preregistration & Data Availability

This study was not preregistered. Study materials are available from the first author by request. Data from this study is not publicly available. Access to this information is restricted for ethical reasons to protect the privacy and confidentiality of families participating in the study. Furthermore, the informed consent procedure did not include a statement regarding public availability of anonymized data.

ORCID

Chehalis M. Strapp https://orcid.org/0000-0002-3336-5597

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