Texting while Parenting: How Adults Use Mobile Phones while Caring for Children at the Playground

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ABSTRACT

Child development research suggests that using phones while caring for children can be problematic, but limited prior work in this space makes defining appropriate use challenging. We conducted the first exploration of whether adults feel pressure to limit phone use in this context and whether they choose to do so. Through mixed methods, we collected data from 466 adult caregivers at playgrounds. We found that phone use was a small part of playground time, yet a notable source of guilt. Adults engaged in systematic and specific phone-use and phone-non-use behaviors in order to prioritize their children above themselves. Our results indicate that caregiver values and self-control together predict behavior and can be used to model phone use in this context. Users' mixed success with engaging in intentional periods of non-use suggests that a design agenda which prioritizes cycles of engagement, disengagement, and re-engagement may be of value to this group.

Author Keywords

Children; Parents; Families; Mobile Phones; Mindfulness; Non-Use

ACM Classification Keywords

K.4.2. Social Issues

INTRODUCTION

Today's mobile phone users have near-continual opportunities to engage with devices and, as a result, are faced with constant decisions regarding the way in which they integrate phone use into their current context. While this has resulted in individuals beneficially incorporating phone use into many aspects of daily life, it has also given rise to broad "pushback" against technology [21] and decisions to limit use of particular technologies or use in particular settings. Understanding users' decisions around technology integration and contextualized use and non-use is a growing area of HCI research [2].

Previous work has identified adults caring for children as a distinct user group with common non-use motivations [9]. Here we examine the ways in which adults use their phones when they have children in their care and their perspectives on the appropriateness of phone use in this context. A limited amount of child development research suggests that caregiver phone use may be detrimental to children [24, 28, 31], and the mainstream media has used this as fuel for an emotionally charged debate [19, 23, 33]. Given these potential sources of pressure, we chose to investigate caregivers' values about their own phone use in caregiving contexts, and how such values translate into emotions and behaviors.

We chose to conduct this investigation at playgrounds, a space where adults and children play together, children play independently, children encounter modestly risky situations [22], and adults enjoy time to themselves – thus providing a variety of social contexts for phone use and non-use. The playground's informal public atmosphere also gave us the opportunity to unobtrusively collect rich, naturalistic data on caregivers' behaviors and phone-use practices. In pursuing this investigation we asked the following research question: How and why do adult caregivers use their phones when caring for children at the playground?

This work provides necessary empirical data for value-sensitive design [10] for a user group that must integrate personal needs with constraints and desires driven by their role as caregivers. The contribution of this work is foremost to sensitize designers to the unique needs of children's caregivers by documenting common habits, beliefs, and concerns related to device-use in caregiving contexts. Our data also reveal distinct subgroups of caregivers and suggest several avenues for creating differentiated technical supports for each. Finally, our results reveal predictive relationships among beliefs about the appropriateness of phone use, patterns of use, reported self-control, and feelings of guilt. These stable relationships across our large sample offer to inform predictive models of user behavior and provide formative work for building new sociotechnical theory.

RELATED WORK

Phone Use While Caring for Children

One body of prior work describes adult phone use when caring for children as detrimental to the children in care [28, 31]. The child development research community has been a forerunner in investigating this space and reported uniformly discouraging findings. Radesky and colleagues collected observational data from 55 families eating together at fast food restaurants. They documented the ramifications of adults' constant connectivity, uncovering thematic distractibility, irritability, and inability to be interrupted among those using phones [24]. Other work has reported that adults respond inappropriately to children when they are distracted by devices [31] and that children experience adults' phone distraction as alienating and emotionally dissatisfying [28].

Researchers have expressed concern that adults' phone use while caring for children is displacing play-based adult-child interactions [28]. As play and face-to-face interactions are the bedrock of young children's social learning and language acquisition [5, 11], adults' phone-use practices are potentially disruptive to critical elements of children's early learning environments. Despite these early investigations, work in this area is still in its infancy [24], and many of these concerns remain speculative. To date, no authoritative body has published specific recommendations or evidence-based guidance for parents on this topic.

Our work builds on these investigations by presenting data on the extent to which adult caregivers are aware of these concerns and investigates adults' behaviors and the motivations behind them. We provide the first data on caregivers' experience of navigating social pressures to put devices aside while caring for children.

Phone Use and Parenting Ideology

A second body of work documents a cultural trend to make unproductive extrapolations from the scoped findings of child development research. In Western culture, the dominant modern parenting ideology, known as "intensive parenting," emphasizes the responsibility of parents and other caregivers to craft an environment for children that is rich with stimulating, caregiver-facilitated activities and interactions, intentionally designed to promote ideal development [14]. Beginning in the middle of the last century and intensifying in the 1990s, this school of thought posits that the agentic and self-reliant caregiver has the capacity to directly shape the cognitive development of the child in care [32]. Parents who are not oriented toward such goals are seen as needing education and improved parenting skills [25].

Critics of intensive parenting have documented that parents experience its standards as unattainable, overly idealized, and disempowering [25, 32]. Past research has suggested that there is little support for the idea that such "concerted cultivation," above a baseline of what children in middle-class, Western society might experience in daily life, im-

proves children's long-term outcomes or increases intellectual ability [3, 32]. On the contrary, prior work shows that intensive parenting limits children's necessary opportunities for free-play, developmentally appropriate risk-taking, and self-entertainment [3, 16, 17].

As prior work has positioned adult phone use as potentially detrimental to children, it is a natural candidate for intensive parenting debate. Given that conversations influenced by intensive parenting standards, such as debates about breastfeeding [18] or mothers working outside the home [6], have led to guilt, confusion, and lack of self-efficacy in parents [30], it is plausible that adults experience negative emotions when reflecting on phone use or non-use in caregiving contexts. Our work provides the first investigation of caregivers' perspectives on this topic.

Designing for Families, Designing for Non-Use

While the CHI community has long designed for families, systematic analysis of this design space [15] shows that the resulting tools typically facilitate communication, coordination, family togetherness, and entertainment. Hashish and colleagues created a prototype technology to help children and parents collaboratively filter content on tablets [13], but research on supports for families which enable reflecting on or limiting technology use are rare.

However, prior work has investigated users' reflections on desired use and their non-use behaviors in other contexts. Prior work documents users' decisions to give up Twitter for Lent [27], resist constant connectivity [20], and respond to social pressure to reduce smartphone dependence [12]. Ames reports that college students experience guilt and anxiety in response to expectations to be continually present with both those they are with physically and those they are connected to through devices [1]. Satchell and Dourish explore the design implications of resistance to phone use and call on the CHI community to consider "the non-user" with the same rigor given to consideration of "the user" [26].

Our work sits at the intersection of understanding families and understanding how individuals integrate technology use and non-use. While each of these areas boasts a sizable body of literature, no prior work has examined the systematic ways in which parents and other caregivers manage their technology habits while caring for children. Our findings lay the groundwork for understanding this design space and supporting these individuals in being users or non-users when, where, and how they see fit.

SITE DESCRIPTION AND METHODS

To understand how adult caregivers use their mobile phones at the playground, we conducted: 1) covert nonparticipant observations, 2) semi-structured interviews, and 3) an online survey, all targeting adults who supervise children at playgrounds in north Seattle. We collected data from 466 adult participants during the spring and summer of 2014.

Study Sites and Participants
We performed observations and interviews at seven different playgrounds in the north Seattle area. Although we collected data from a diverse set of neighborhoods, this sampling was not intended to be representative of the general population. We included only caregivers who were supervising at least one child who appeared to be less than 10 years old. There were no exclusion criteria based on caregiver characteristics, and we observed a variety of adult caregivers including parents, grandparents, and nannies.

Total Respondents = 154	
Gender	Female (79%), Male (21%)
Relationship	Parent (93%), Nanny (6%), Other (1%)
Household Income	<$50K (6%), $50K-$75K (8%), $75K-$100K (14%), >$100K (60%), No Response (12%)
Race/Ethnicity	Non-Hispanic white (87%), Hispanic (6%), Asian (3%), Mixed race (1%), No response (3%)

Table 1. Demographic information for survey participants

We took notes on 171 adult caregivers during our qualitative observations (69% female). We timed the phone use of a separate 111 adults (68% female). We were unable to judge other demographic information about these individuals with certainty. We interviewed 25 adults (84% female). Of interviewees, 18 (69%) were parents; 5 (19%) were nannies; and 3 (12%) were other family members. Demographic information for survey participants is shown in Table 1.

Observations of Caregiver Behavior
Over three months, researchers individually visited seven playgrounds in north Seattle. Site visits were spread over all days of the week between 8 a.m. and 7 p.m. Across 22 visits we collected a total of 33 hours of observational data. Because we could not always observe all individuals simultaneously, researchers chose a subset of caregivers to observe based on their location within the playground and their arrival time. Once the researcher began observing a caregiver, she continued observing him or her until the caregiver left the playground. We documented field data in jottings which were later used to develop ethnographic fieldnotes [8].

Quantitative Observations of Phone Usage
During an independent set of visits to the same field sites, we observed an additional 111 participants without taking jottings. Instead we timed participants' phone usage precisely (in seconds) in order to quantify the frequency and duration of phone usage at the playground. Again, we assigned field sites to random days of the week and times of day, and we selected a subset of caregivers based on their locations and arrival times. Together across both types of observations, we observed 41.4 hours of playground time and recorded data on 282 caregivers.

Interviews with Caregivers
As adult caregivers' perspectives and experiences related to phone use at the playground were not accessible through observation alone, we conducted semi-structured interviews with an additional 25 participants. We approached and recruited participants at the same playground field sites using the same inclusion criteria as our observations. Given that caregivers were supervising children when we solicited interviews, our interview was intended to last no more than 15 minutes. We gave interviewees freedom to attend to their children and supported interruptions during the interview. Some participants generously spent 40 minutes or more elaborating on their responses.

Our interview protocol was shaped by early findings from our observations and was designed to elicit caregivers' self-reports describing their phone-use behaviors, motivations for phone use, and values and beliefs about phone use at the playground more broadly. Example questions included *"How have you used your phone while you've been at the playground today?"* and *"Do you have any particular strategies for keeping an eye on your child when you're using your phone?"*

After completing the interview, participants were given a $10 gift card as a thank-you for their participation. The total combined length of all interviews was 247 minutes (mean = 9.88, SD = 7.17). All interviews were audio recorded and transcribed by the research team.

Survey of Caregivers
Based on findings from our interviews, we developed a survey protocol to determine whether interview themes would be corroborated by a larger sample of the same community. In order to draw from the same population, we advertised to online groups and mailing lists that 1) restricted membership to either parents or to nannies and 2) had residency requirements limiting membership to those living in the areas surrounding our field sites. We asked caregivers to report on their mobile phone use at the playground, desired mobile phone use at the playground, motivations for choosing to use or avoid using mobile phones at the playground, strategies for integrating phone use into playground experiences, and beliefs about appropriate phone use, among other topics. As a thank-you for their participation, respondents had the opportunity to enter a raffle for $15 gift cards (with 1 in 10 odds of winning). We received complete responses from 154 caregivers who routinely visit playgrounds in north Seattle. Of the 47 survey questions, 9 were open-ended. Two researchers coded open-ended questions for 14 codes spread evenly across 6 categories. Average agreement (Cohen's κ) on a random 10% of the data was .873 with all values of κ > .71. Disagreements on codes were discussed until they reached consensus.

Qualitative Analysis
Using a grounded theory approach [4], we iteratively reviewed and coded field notes, interview transcripts, and open-ended survey questions for themes. Data collection

and analysis were interwoven, such that themes from early observations were used to develop our interview protocol, and themes that emerged from interviews formed the basis of our survey development. Data analysis was continual throughout our data-collection process. Each researcher reviewed her own data independently and the team collaboratively created a codebook capturing salient themes. Field-note codes from observations covered nine areas: child-caregiver interaction, children's attempts to interrupt adults, caregiver position, supervision style, phone activities, non-phone activities, balancing phone use with child needs, behavior just before and after phone use, and children's activity during phone use. Code categories drawn from interview data included: beliefs about the purpose of the playground, parenting style, concerns about phone use while caring for children, and benefits of phone use. After finalizing the codebook, each researcher independently coded the same randomly selected field note. Codings were reviewed as a group to ensure consensus. Using data from fieldnotes, we drafted analytical memos to develop themes. The memoing process was repeated for data collected from interviews and open-ended survey questions.

Ethics Statement

In undertaking this research, we considered the ethics of conducting observations of public behavior without participants' knowledge or consent. We felt that informing those we observed would potentially alter their behaviors (raising concerns about the validity of the data) and detract from their experience at the playground. It would also have been prohibitive to broadly solicit consent from all playground-goers. As we did not collect identifiable or sensitive data, and participants had no reasonable expectation of privacy, we chose to observe unannounced. This is consistent with the limited prior work investigating caregiver behaviors in this space [4]. The Institutional Review Board at the University of Washington deemed this study exempt from review per federal exempt category 2 for surveys, interviews, and observations of public behavior.

RESULTS AND ANALYSIS

Description of Phone Use

The Amount of Time Adults Spend Using Phones

For the majority of our participants, phone use was a non-dominant part of their time at the park. This was consistent across all behavioral observations and corroborated by our quantitative observations. Nearly two-thirds of our participants spent less than 5% of their time at the park using a phone, including 41% who did not use a phone at all (see Figure 1). When adults were using a phone it was often for a short period of time. Nearly 30% of all uses were less than 10 seconds long and more than half were less than one minute (see Figure 1). Phone use via voice calls was far less common than phone use via touch interaction and comprised roughly 5% of all instances of use. We found no significant effect of gender on the percentage of playground
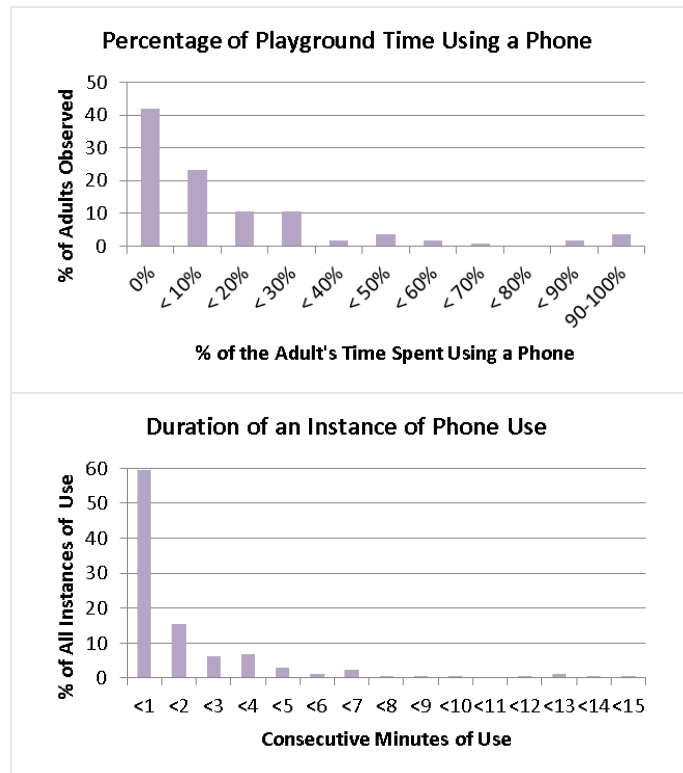
**Figure 1: Top – Amount of time spent on the phone
Bottom – Duration of phone uses**

time spent on the phone, average duration of an instance of phone use, percentage of phone time spent making voice calls, or total number of instances of phone use.

What Adults do on Phones and Why

Interviewees reported using their phones for texting (48%) and calling (48%), followed by email (38%), picture-taking (38%), and Facebook (20%). A small minority of interviewees mentioned other online activities and checking the time, and one interviewee reported playing casual games on her phone. These reports were consistent with our survey data, though survey respondents reported each of these uses with higher frequency. This may be reflective of the fixed set of options provided to those surveyed, in contrast to our interview protocol, which asked participants for a free recall of the ways they use their phones. Table 2 reports the frequency with which survey respondents use these and other technologies at the playground.

The end-goals behind this technology use were varied (see Table 2). Tasks potentially related to childcare, such as checking the time, coordinating with others, and taking pictures, were reported more than twice as often as parent-centric tasks such as socializing, doing work, or viewing entertaining content.

In addition to describing the purpose of their phone use, we asked survey participants to report the type of situations that lead them to use the phone at the playground. The most frequently cited trigger for phone use was boredom, report-

ed by 40% of those surveyed. We also asked participants to report situations that cause them put down the phone. A majority reported at times choosing not to use their phone because they felt it would compromise child safety (57%), make it hard to be responsive to their child (65%), or model behavior that they do not want their child to emulate (52%).

Absorption when Using Phones

Adults' Responses to Children with and without Phones
As prior work has tied adult phone use to a lack of responsiveness to children [24, 28, 31], we compared participants' responsiveness when they were and were not using phones. We observed 32 instances in which a child attempted to interrupt or gain the attention of an adult using a phone. In 18 cases (56%), the adult did not respond to the child at all, (did not speak and did not look away from the phone).

By comparison, we observed 70 instances in which a child attempted to interrupt or gain the attention of an adult who was *not* using a phone. In these cases – when the adult was tending to the needs of another child, engaged in conversation with another adult, or simply removed from the play area and staring into space – children's bids for attention were usually met with a prompt reply. There were 8 instances (11%) in which an adult without a phone did not respond in any way to a child's request.

Thus we saw a notable difference in adults' ability to be interrupted when they were and were not using phones. Interrupted adults did not always provide responses that satisfied children, for example, we observed an interaction in which: "The boy says, 'Mom, look!' 'Mom, look!' And asks if she will play with him. She says, 'I have to stay with the dog…there are other people you could play with'" (Field Observation). But it was rare for an adult to remain silent unless he or she was using a phone.

To contextualize this absorption, we saw these 102 total interruptions across 33 hours of observation, always observing multiple children at once. That is, across several child-adult groups we saw one interruption roughly every 20 minutes. The majority of playground time was dominated by adults sitting and watching as children played independently and by adult-child interaction.

Adults' Experiences with Absorption
We investigated adults' awareness of and feelings about the absorption we observed in phone users. The majority of our interview participants (22 of 25) spontaneously mentioned that either they or phone users generally pay less attention to their physical surroundings when using phones. However, our interviewees also expressed confidence that when they use phones they consistently monitor for children's requests. We asked interviewees who had used a phone at the playground that day to report what their child had been doing during phone use. In response, we received a variety of vague and sometimes defensive answers, such as:

Technology	%		Purpose	%
Texting	85		Picture-Taking	88
Camera	85		Coordination	79
Email	64		Check the Time	75
Voice calls	57		Available: Emergency	71
Clock	49		Available: Family	71
Social media	48		Sharing Pictures	47
Browser	28		Information	41
Games	5		Available: Work	41
Reading app	3		Socialization	30
Video calls	1		Do Work	28
None	2		Entertainment	21

Table 2: What survey respondents do on phones and why

"Yeah, so either climbing on some structure or playing. I kind of try to watch obviously." – P23

"I did those things very quickly. They just kept doing whatever they were doing" – P20

"Um, pretty much what he's doing now?" – P11

Collectively, our interviewees reported that they believe phone use dilutes their attention to the physical world, but also that their children's requests draw them back to the present moment on demand, an opinion that was at odds with the behavior we observed.

Survey participants agreed with interviewees; more than 80% of respondents reported that it is more difficult for them to pay attention to their children when using a phone (Figure 2). Like interviewees, survey participants were less likely to agree that phone use makes it harder to respond to child requests. Participants reported feeling significantly more confident that their child can get their attention when requested than confident that they are proactively paying attention to their child ($t = -8.96$, $p < .001$) (Figure 2). Thus, while adults generally believe that they are absorbed when using phones, many still believe that their absorption does not hinder their ability to be available upon request.

Values and Beliefs about Using the Phone
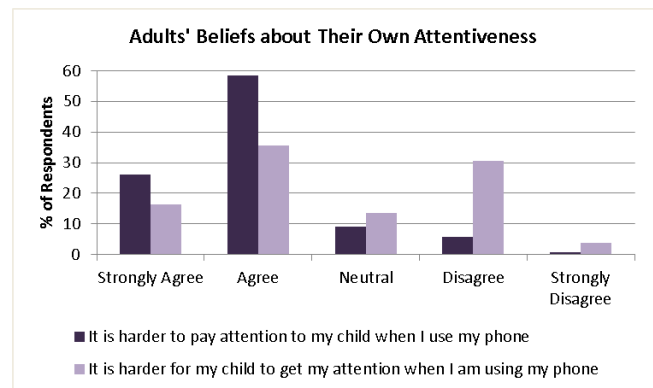Through qualitative analysis, we found that both interview-

Figure 2: Adults believe they are absorbed by phone use but many feel they remain as available to their children as when they are not using phones

ees and survey respondents fell into three distinct categories based on self-reported values regarding phone use: 1) caregivers who believe it is appropriate for adults to use their phones whenever their children are safe and occupied, 2) caregivers who believe phone use should be minimized but that they are unable to live up to this ideal, and 3) caregivers who believe phone use should be minimized and that they successfully achieve this ideal minimization. These were not categories that the research team had preconceived and we did not describe or prompt participants to identify with any of these profiles.

Profile 1: Confident Users
A sizeable minority of interviewees (28%) expressed the belief that within certain bounds – typically, when children are safe and occupied – phone use of any kind is appropriate. These interviewees unapologetically described instances where they were *"just, like, sitting there on Facebook or texting somebody,"* (P16), *"online checking grades,"* (P15), or *"checking Facebook or work email, basically. Sometimes I read the New York Times on my phone"* (P23). As one father explained: *"As long as I can see him I'm comfortable [using the phone]"* (P4). These users expressed no reservations about using their phones at the playground and no desire to regulate their phone use in any way, provided that their child was safely and independently occupied.

Like interviewees, a non-trivial minority (18%) of survey respondents expressed beliefs consistent with this profile. These individuals reported feeling comfortable using their phones without restrictions, though again adding the disclaimer that their child must be safe and happy. As one survey participant explained: *"If my child is playing independently and is in a safe situation, I see no reason not to do my own thing."*

Profile 2: Users Who Would Like to Increase Non-Use
Nearly half of all interviewees (44%) reported both that they believe phone use should either be completely minimized or restricted to specific playground-appropriate tasks (such as taking pictures of children, checking the time, or managing essential coordination) and also that they struggle to live up to this self-imposed standard. These participants used the word "try" when describing their efforts to avoid phone use, such as: "*I try very hard not to check email or do Facebook,"* (P1) *"I try not to be on it if I don't have to,"* (P19), or *"I tried to leave it [at home]"* (P10). Despite their reported attempts to disengage, these participants described struggling to resist the desire to use the phone. While many felt they were doing a good job of working toward this goal, all reported that they would like to use the phone even less.

Similarly, 40% of survey participants reported simultaneously that they believe phone use should be limited and that they would like to make further progress toward this ideal. As participants explained:

"At the park, I want to use my phone less…The more I keep my own promises regarding my phone use, the better I feel."

"I don't want to be addicted to my phone… The less she sees me holding it, the better… I use my phone more than I would like."

"I want to use it less, but bad habits are hard to break!"

These caregivers described themselves when using the phone in front of their child as: *"not as attentive," "not as responsive," "ignoring," "not a good role model," "a slave to my phone," "absorbed in the device,"* or *"set[ting] a bad example."*

Profile 3: Confident Non-Users
A third group of participants expressed the belief that phone use in this context should be minimal, and they have successfully achieved this. These participants made strong statements about consistently living up to the standards they hold for themselves around phone use. 24% of interviewees fell into this category and described their phone use with statements such as: *"Everybody who knows me knows that I don't answer the phone [when caring for children]"* (P5).

This category emerged naturally among the larger sample of survey participants as well. Of those surveyed, 36% felt that phone use should be kept to a minimum and that they successfully achieve this standard. One participant described her own behavior saying: *"I typically don't have trouble leaving my phone in my pocket for an hour and I regularly can go for a whole playground visit without pulling it out. This is about the way I want it to be."*

Implications of Caregiver Profiles
We found that caregiver profile was a significant predictor of feelings of guilt. A Kruskal-Wallis H test showed that the effect of caregiver-type on the extent to which participants agreed with the statement *"I feel guilty when I use my phone at the playground"* was significant ($X^2(2, 137) = 25.29$, $p < .001$). Post hoc analysis using the Tukey HSD test indicated that 1) caregivers who believe they have successfully minimized their use feel significantly less guilt than phone users who would like to further reduce their use ($p < .05$) and 2) that caregivers who believe phone use is appropriate whenever children are safe feel less guilt than caregivers who believe all phone use should be minimized ($p < .05$).

Surprisingly, it also showed that confident non-users feel significantly more guilt than caregivers who believe phone use is appropriate whenever children are safe ($p < .05$). One might expect that users who feel fully satisfied with the way they use their phones would feel no more guilt than those who believe all phone use is appropriate. But for our participants, valuing minimal phone use was associated with increased feelings of guilt regardless of how effectively users' felt they controlled their behavior.

Perceptions and Judgments of Self versus Others
Our investigation was motivated in part by social commentary on using phones while caring for children, and we explored the extent to which caregivers feel judged for their phone use and the extent to which they judge others. Only two of our 25 interviewees were primarily critical of other caregivers' phone use at the playground. Nearly all inter-

viewees were primarily agnostic toward other adults' use, with a subset going further and making statements of support, explaining that what they see from others *"feels good,"* (P22), that they are *"impressed"* by other caregivers (P19), and that *"people are pretty attentive to their kids"* (P23).

While some interviewees explained that they "worry" about other adults not giving children high quality attention (P8) or feel that others should "temper [their use] a little bit" (P12), in these instances, interviewees explained that they are equally concerned about their own behaviors. Further, interviewees who held themselves to a standard of minimal or no phone use while caring for children held more relaxed standards for other caregivers. Many interviewees expressed discomfort with the idea of judging others, explaining *"I'm one of those connected people so obviously I can't judge,"* (P23) or *"it's easy to judge…but I try not to"* (P22).

27% of participants reported feeling judged, suggesting that feelings of judgment may be a minor theme. Despite participants' reluctance to judge others, we found significant differences between adults' perceptions of their own behaviors and their perceptions of the behaviors of others. A paired-samples t-test revealed that participants were more likely to agree with the statement *"the way I use my phone at the playground is appropriate"* (mean = 2.21, sd = 0.75) than the statement *"the way other adults use their phones at the playground is appropriate"* (mean = 3.14, sd = 0.70, $t = 4.10$, $p < .001$). Response options ranged from *"1: Strongly Agree"* to *"5: Strongly Disagree."* Participants were also significantly more likely to agree that others should reduce their phone use (mean = 2.55, sd = 0.86) than that they should do so themselves (mean = 2.87, sd = 0.96, $t = -11.95$, $p < .001$).

Thus, despite commentary reflecting reservations about passing judgment, participants feel that their behavior is both more restrained and more appropriate than that of their peers. These results are consistent with the gap between perceptions of self and others observed in other domains, such as the classic example of 90% of drivers believing they are more cautious than the average driver [7, 29].

Adults' Interest in Technology Support
Given that 40% of interviewees and 44% of those surveyed reported a desire to change their current phone use habits (either by reducing the total time they spend with the phone or by cutting down on particular behaviors), there may be a design opportunity in this space to support adults in achieving their desired phone use. However, when we asked survey participants whether they would be interested in a tool to *"help monitor [their] phone use and achieve [their] desired phone use,"* the response was negative. 74% of all participants and 60% of those who wanted to change their behavior were firmly against the idea of using such a tool, while only 16% of all users and 26% of those looking to change expressed enthusiastic interest. Negative responses reflected thematic resistance based on: satisfaction with their current behavior (41%), valuing self-monitoring (21%), the oxymo-

ron of using technology to reduce technology use (17%), and general technology fatigue (9%).

Two of these themes, valuing self-monitoring and the belief that technology to manage technology use is problematic, may pose unique barriers to designing to support this goal. Many respondents who expressed a desire to reduce phone use were resistant to the idea of leaning on supports and felt they should be able to change their behaviors themselves. They explained: *"I really should just limit my own usage and not be so addicted that I need an app,"* and *"Apps like these are for weak-minded people with no self-control…I will strive harder next time."* This category of comments suggests that designing to support adults who wish to reign in their phone use at the playground will require consideration of their potentially competing desire for self-sufficiency.

A second design barrier may be the fact that so many of our participants viewed technology as an inherently unproductive vehicle for delivering solutions to support intentional technology use. As one respondent explained: *"An app to cut down on apps? It feels like it feeds in[to] cell phone dependency."* Though many respondents who expressed this opinion wanted to adjust their usage, they felt that technological supports were as concerning as the technologies they want to avoid. This category of comments suggests that designing to support adults in achieving this goal will require consideration of the fact that new technologies may be rejected and solutions may need to be invisibly embedded in adults' current experiences on the phone. This value and thus this design barrier may extend to other groups of users trying to resist technology and to other non-use contexts.

Respondents who were unequivocally interested in trying out such a tool (16%) hoped that it would help them *"see perception vs. reality"* in the amount of time they spend on the phone. Respondents most frequently reported that reminders to put down the phone or data documenting their actual use would be most helpful.

Practices for Integrating Phone Use at the Playground
In absence of tools to support caregivers in achieving their ideal phone use, we observed that participants engaged in five thematic practices when using their phones at the playground, which appeared to serve as attempts to mitigate the impact of phone use on children. We probed this topic with interviewees and learned that some of these are conscious strategies intended to mitigate phone absorption.

Using the Phone in Short Bursts
Adults commonly used their phones at the playground for very short periods of time: taking out the phone, looking at the screen momentarily, putting it away, and then returning to attending to their children. Although we observed some caregivers who used their phones for extended periods of time, most instances of adult phone use were very brief. This was corroborated by our quantitative observations of phone use in which 40% of phone uses were 30 seconds or less. 36% of survey participants reported that they inten-

tionally practice this strategy of short-burst phone use. Interviewees described using this strategy as well; as one explained: *"When I use it, it's usually **quick things** like messaging or I don't really have time to read long article or like that. So that's my strategy – **short quick things"** (P11).*

Glancing Back and Forth between Phone and Child
We also observed that adult phone users frequently glance back and forth between their phone and their child, often shifting their gaze as frequently as every few seconds. 37% of survey participants reported that they do this regularly and several interviewees spontaneously described glancing between phone and child. When asked how she used her phone, one interviewee said she would *"look at it and then… fiddle around with something, like email or texts, and then **glance up and then go back"** (P16).*

Waiting until the Child is Safe and Occupied
Adults systematically used their phones when their children were safe and occupied, for example, waiting until children were playing in a contained area like a sandbox or using the phone when children were playing cooperatively with others. The majority of interviewees reported that they tactically use phones once children are in *"safe"* situations, as did 58% of survey participants.

An exemplar of this strategy is phone use while young children are in swings. We frequently observed adults using their phones while their children were in bucket swings with leg holes and a safety belt intended to keep young children in the seat. Toddler swings restrain and protect the youngest children at the playground in a way that no other playground equipment does. Adults concurrently attended to their phones and their children by pushing them on the swings with one hand and holding, scrolling, tapping, and looking at their phone in the other hand. This was corroborated by interviewees as a conscious strategy.

Post-Phone Adult-Initiated Engagement
We observed adults initiating enthusiastic interactions with their children immediately after phone use. Though no interviewees commented on this explicitly, in our behavioral observations we noticed an ebb and flow of adult engagement with children such that during phone use adults typically did not engage with their children but proactively initiated interaction immediately after putting the phone away.

For example, one participant used his phone for about fifteen minutes. After putting his phone back in his pocket, he walked up to two boys playing in the sandbox, *"hold[ing] up his hands and curl[ing] his fingers to make monster claws and growl[ing]"* (Field Observation). In these instances, adults' engagement with children 1) followed a period of focused phone engagement, and 2) was adult-initiated rather than in response to a child request or interruption.

Avoiding Phone Use
To mitigate potential effects of phone use on children, interviewees reported deliberately making their phones inaccessible as a means of avoiding phone use altogether at the playground. One interviewee (P10) explained that she was not tempted to use her phone that day because she intentionally did not bring it to the playground. Three other interviewees (P12, P14, and P5) reported leaving their phones in their bags, so that phones were available but more easily ignored. Survey respondents also reported an inaccessibility-as-avoidance strategy and described leaving their phones in the car or using flip phones instead of smartphones to minimize features and potential distractions.

DISCUSSION & CONCLUSION
Our results provide extensive empirical data on phone-use decisions within a specific group of users with a common potential motivator for pushing back against technology. Our findings indicate that, for the majority of our participants, phone use occupies a small fraction of their time with their children and that this limited use is intentional. A small set of common, child-centric concerns – the need to 1) supervise, 2) be responsive, and 3) act as a role model – drive this intentional non-use. Though no formal, expert guidance suggests they do so, the majority of our participants (68% of interviewees, 76% of survey respondents) attempt to minimize their phone use and report negative emotional experiences of engaging with technology while children are in their care. Further work remains to tease apart the extent to which these negative feelings arise from their personal experiences with phone use and the extent to which they arise from a social climate that is critical of phone use by caregivers.

Relatedly, participants found their phone use to be more acceptable when it either involved the child (taking pictures) or directly related to the child's needs (coordination with others, setting a timer). Even participants who believe phone use should be minimal usually felt comfortable engaging with the phone for child-related reasons. These results suggest that for many caregivers, playground time centers on child needs and phone use is appropriate only in service of these needs. Desired patterns of use and non-use for these caregivers arises from their perceptions of what is best for their children rather than what is best for themselves.

For a large subgroup (nearly half of participants), a gap exists between desired and actual patterns of use and non-use, and this delta is a source of guilt. These participants report wanting to change their behavior and feeling unable to do so. Given the success of self-monitoring tools in a variety of other domains, this space appears to be a promising target for data-tracking and goal-setting applications. As participants both underestimated the extent of their unresponsiveness and felt notable guilt even when their overall phone use was minimal, providing these individuals with accurate behavioral data may be valuable. Capturing and

reporting such data could potentially support caregivers in better achieving their expressed values (e.g., improving responsiveness) and assuage unnecessary guilt (e.g., by showing that their usage is minimal). However, participants' resistance to new technologies also suggests that the experience of collecting and viewing such data would only be acceptable if embedded seamlessly into their current digital experiences. These data also suggest that altering existing applications to be less tempting and more respectful of non-use desires would also be of value.

Our findings further reveal that while this device-resistance is prevalent, it is not universal. A distinct subgroup of caregivers expressed that unlimited adult phone use is appropriate and that they have no desire or intention to limit their time with the phone. Thus the larger user-group of those caring for children is not monolithic; use and non-use intentions and behaviors are better predicted by caregiver profile than by general status as a caregiver. Supporting and designing for caregivers who value unlimited use will likely look very different from supporting and designing for caregivers who value minimal use. Our results suggest that to best understand this user group, value-sensitive design for caregivers should probe whether or not an individual values minimal use in caregiving contexts, as well as the individual's perceptions of his or her own behavioral control.

Finally, the subgroups of caregivers that emerged from our data and their associations with specific emotional experiences related to phone use suggests that these categories offer predictive utility. Concerns about supervision, responsiveness, and modeling appear to predict feelings about phone use. Feelings about phone use, purpose of phone use, and perceptions of behavioral control in turn appear to predict phone-use behavior in this context. Participants reported that their values about phone use at the playground are similar to their values about phone use when caring for children in other contexts, thus the relationships we document here may be useful for modeling caregivers' desires and behaviors across a variety of contexts and technologies. Further work remains to develop and assess this theoretical model.

Nearly every interviewee and survey respondent reported having thoughts about phone use in caregiving contexts. Caregivers' consistent ability to articulate their desired phone use suggests this is a salient topic for these users. Within this community, the majority of caregivers appear to think about this, value minimal use, and translate this belief into behavior. These include common patterns of use (e.g., using a phone only after securing a child in a swing) and common patterns of non-use (e.g., locking the phone in the car). While these use and non-use behaviors are superficially different, they are enacted to achieve the same end-goal of enabling caregivers to put child needs first.

Our findings show that the need to prioritize child-centered concerns is fundamental across diverse members of this user group and should not be ignored. Today's technologies

support this need with mixed success. Mobile phones give our "confident users" the freedom to first provide their child with outdoor free-play and then engage with technology. Caregivers of all types appreciate the phone's ability to take pictures of children and facilitate real-time coordination while they are at the playground. But our "users who would like to increase non-use" report frustration with their phone-engagement. These reported positive and negative experiences are both consistent with a world in which designers focus on engagement with minimal consideration of disengagement. Our results suggest that designing to support user-driven disengagement and re-engagement would be of value to this group. In absence of this, caregivers who feel their phone use inhibits their ability to prioritize child needs express a significant guilt burden, take measures to restrain their own behaviors, and in some cases abandon their devices altogether.

Our sample, and the Seattle metropolitan area, is less racially diverse, has a higher educational attainment, and higher household income than the American average. Patterns of phone use, technology access, caregiving attitudes, and family resources are likely to differ between the communities we studied and other areas. Future work remains to understand the extent to which our findings generalize to other populations. While participants reported that their values and behaviors at the playground are consistent with their values and behaviors in other caregiving situations (and thus may generalize beyond the playground), our sample was restricted to adults who bring their children to the playground in the first place. Future work is needed to understand whether these patterns hold among caregivers who are less likely to provide playground opportunities.

Parenting is a challenge in many ways, and the HCI research community has long investigated opportunities to support parents through technology. Our data provide new understanding of the needs of parents and other caregivers and offer to inform new models of caregiver behaviors in sociotechnical contexts. Such an understanding opens many new design possibilities including extracting design principles from the values we document here; designing for cycles of engagement, disengagement, and re-engagement; and examining caregiver guilt as a design target. We look forward to future contributions and discussion in this space.

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