

Social and Technical Challenges in Parenting Teens' Social Media Use

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ABSTRACT

With millions of teenagers on the Internet, millions of parents are trying to understand what their teens are doing and why. Understanding how technology use impacts teens' learning, growth, and social development is critical for their health and wellbeing and for the welfare of the family. Yet, balancing parent authority with teen privacy and autonomy is difficult. We conducted an interview study with 16 parents to examine challenges in "technoparenting"—parenting teens' technology use. Parents said they wanted more transparency in their teens' use of cell phones and the Internet and they struggled with their own unfamiliarity with technology. Technoparenting is a distributed problem and, surprisingly, parents wanted support and collaboration from the broader community. We conclude with design implications for a socially translucent "digital window."

Author Keywords

Parents, teens, Internet, texting, social computing.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors.

INTRODUCTION

"I have limits on her phone. She just can't help herself. If the phone is there, she can't stop doing it. In the morning it buzzes with a text message from a friend... During exams we'll try to keep the phone out of her room and it's a constant battle. So I've put time limits and number limits and I've basically given her the latitude to say as long as your school work's okay, it's up to you."—J3

"I'm not sure that he knows I've searched his history. I also feel that some of those things of parenting, you don't have to tell your kids everything. You're not friends with them; I love them but it's my responsibility to raise them as safe, healthy, and independent adults."—W15

About 23 million teenagers will get online today in the

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U.S., hanging out in chat rooms and on social networking sites [1,26]. 18 million teens have cell phones of their own and 4.5 million of them will text over 100 times by tonight [26]. While they're doing this, over 17 million fathers and mothers will be watching their teens [1], wondering what they are doing and why. How many texts is too many? Is it okay to study with chat open and the TV on? Is texting in bed or at the dinner table socially appropriate? How is texting changing communication and relational abilities among teens and broader notions of etiquette within society? Understanding how technology and social media use impacts teens' learning, growth, and social development is critical for their health and wellbeing and for the welfare of the family.

We conducted an interview study with 16 parents from suburban neighborhoods in Atlanta, GA to investigate these questions. This paper describes the struggles and strategies they report in parenting their children's technology use. The goal is to surface different approaches to managing technology use that parents currently use and explore ways of supporting them to do it better. We begin with a grounded theory approach to analyze the interview data, then use a framework inspired by activity theory to organize the results. We conclude with design implications for a socially translucent "digital window."

RELATED WORK: A WINDOW INTO TEEN SOCIAL LIFE

Teens are early adopters and heavy users of technology, especially in developed countries where access has grown rapidly in recent years. Teens are chatting, instant messaging, Facebooking, YouTubing, and gaming [19,27,29]. For example, 75% of 12-17 year-olds own a cell phone in the U.S. and 72% of them are text messagers [26]. Similar adoption patterns are seen in many countries around the world. The frequency of texting has overtaken that of every other common form of interaction with their friends (such as calling, talking face to face, social networking, instant messaging, or email) [26]. To parents of teens, the statistics become a reality when they see their teens tied to their cell phones: texting with an open fridge door, texting immediately out of the shower, or texting a friend immediately after returning home from being out with the same friend. Texting is only one instance of broader trends in teens' socializing patterns. Technology has changed the fabric of teens' home and social lives, but it has also dramatically changed the lives of parents.

Parents tell us they have struggled to understand what their children are doing with technology and why and how to set rules and boundaries for effective parenting. The issue is complicated. The process of parenting is historically conditioned—every generation of new technology (like television and landline telephones) has necessitated new trial and error approaches to parenting. Decades of Dear Abby op-eds depict a droll and often humorous chronology of anxious mothers’ struggles with their children’s use of the telephone and television. While some parts of parent-teen interactions are timeless, the mobile and personal nature of technology pushes the boundaries of parenting in new ways. First, parents can be somewhat blind to what their children are doing with technology because it is personal and mobile. Second, children’s technology use is a distributed problem and requires collaboration among their broader community—teachers, coaches, extended family, and school administrators. From this perspective, “technoparenting”—parenting teens’ technology use—can be daunting.

Parent-Teen Interactions

Researchers have been studying children and Internet use since the 1990’s [6]. More recent investments from large foundations like Pew, Kaiser, and MacArthur have spurred a community of researchers around the study of “digital youth” [22,26,36]. Yet there has been little research examining parenting with respect to children’s technology use in HCI, and in particular, little focus on parent-teen relationships around technology use. Other research on family interactions has focused on tracking babies’ development [24], domestic media spaces for connecting families across long distances [23], intergenerational photo-sharing and design teams [10,11], and parent-child communication in divorced families [43]. Rode’s study presented tensions around safety and security of children’s use of technology at home [37]. Brush and Inkpen included teens in their study of technology sharing in public and private spaces in homes [7]. They found that parents expressed concern over controlling their children’s computer and Internet use and took actions to limit time, kinds of use, and location [7]. Judge et al. similarly found that autonomy—the control to turn a “family window” on or off—was an important part of a home media space [23].

Other research has focused on teen roles in family technology use. Mesch reported characteristics of intergenerational conflicts focusing on teens at home [33], including issues of privacy [13]. Notably, many conflicts arose because families had only one computer and one phone line at the time. Ling examined the social impact of the mobile phone on power relations as teens were “emancipated” from their parents’ authority [28]. Finally, Kiesler et al. described the “teen guru” which characterized teens as a source of technical help and advice that flows from teen to adult [25]. They conclude with a call for more research: “What changes occur in generational dynamics when children have more knowledge in some domains than

their parents? This question remains largely unanswered and motivate our work, though researchers have made headway on technological mediation [12,29], parenting of MySpace [38], and class issues [4].

Specific to Internet use, researchers have examined parent-child perspectives around forms of technology mediation and Internet risk prevention. Livingstone and Helsper [29] found that parents preferred social forms of mediation (e.g. discussions and co-viewing) over technological ones (e.g. monitors and filtering). Yet these strategies were not effective in reducing risk, whereas parental restrictions were. Byrne [8] found that communicative style and parenting style predicted disagreements between parents and children about Internet risk prevention strategies. Specifically, when children felt it was hard to talk to their parents about Internet use, they tended to disagree more with their parents about Internet risk prevention strategies. However, both parents and children agreed that empowering children is good.

Parenting Styles

One reason tensions in parent-teen¹ relationships develop is because they disagree about how much and what kinds of autonomy teens should have and how much authority parents should have. Effective parenting requires a balance between parents’ authority and children’s agency in their own lives. Over-restriction can lead to psychological reactance, in which children feel their behavior is being threatened and respond in the opposite direction or by circumventing the restriction [5]. Parenting authority can be grouped into four domains [35,40]:

- *Moral* (don’t hit, do share)
- *Prudential* (don’t run with scissors)
- *Social conventions* (be polite to elders)
- *Personal* (privacy, friendships, music, activities, clothing, and self-expression)

The personal domain is where the majority of conflicts between children and parents occur [39]. Teens might not argue with moral or prudential rules, like not stealing and not running in the street, but they do argue with personal rules [35]. Conflicts arise when they disagree on what constitutes personal business, such as a girl who wants to wear a short skirt. The girl wants discretion and autonomy in choosing what to wear; the parent argues that this is part of family and social conventions and not up for discussion. Conflict is routine in adolescence, and teen relationships with peers and parents can be inconsistent and unstable.

Although there are inherent tensions in parent-teen relationships, there are a number of well-formed theories of effective parenting. They distinguish parenting styles into

¹ “Teen” or “adolescent” is roughly ages 12-17, “preteen” is 6-11. Child and kid are under 10 or any age as the offspring off the parent. These are soft categories mostly useful for denoting developmental stages in life.

four constructs: *authoritarian, permissive, uninvolved, and authoritative* [3,31]. Parents are highly demanding, but not responsive. They expect their rules to be obeyed without reason or explanation. Permissive parents are responsive but not demanding. They are lenient and avoid confrontation. Uninvolved parents are neither demanding nor responsive. They are detached, dismissive, or hands-off. Finally, authoritative parents are both demanding and responsive. They set clear standards and limits but explain their reasons and motives during punishment. Authoritative parenting is the recommended style of parenting by child-rearing experts. Children with authoritative parents tend to be happy, capable, successful, more socially competent, and have higher self-esteem [31].

A series of questions emerge in the context of technology use. What categories do different behaviors fall under? How do subjective categorizations differ between parents and teens and what conflicts arise? What are the best parenting strategies when teens are more comfortable with technology than parents? In what ways might a disruption of power emerge when parents report not knowing what their children are doing or why?

Activity Theory

Our approach to organizing our data is inspired by an activity theory (AT) framework. AT is a useful framework for understanding people’s relationships with technology [34]. Parenting is already a complex process and the steady firehose of new technologies in childrens’ lives adds more layers of complexity. Activity theory acknowledges the dynamic and potentially disruptive impact that technology can add to the parenting process. At the same time, it gives voice to a parent’s greater motive—the development of healthy, well-adjusted teenagers.

AT evolved from Leont’ev’s observation of the richness of the social world and the activities embedded in it. Leont’ev viewed human processes as phenomena and developed AT as a framework for mapping the elements that influence human activity (see Figure 1). Activity systems consist of a group of people—the *community*—who have shared goals and interests—their *object*. *Subjects* are the people directly involved in the activity. In the context of parenting and technology use, the object is supporting the development of healthy, well-adjusted teenagers and the community consists of parents, schools, teachers, and government. The subjects—the people engaged in the activity of parenting—are the parents (see Table 1).

Tools and *rules* are the components that help frame how the activity is accomplished, and what norms and conventions are adhered to while engaging in it. *Division of labor* explains how work is divided among people involved in the activity. In the context of parenting, tools are the technological means through which parents can monitor and manage their children’s use of technology (e.g. checking browser history). Rules are the boundaries and

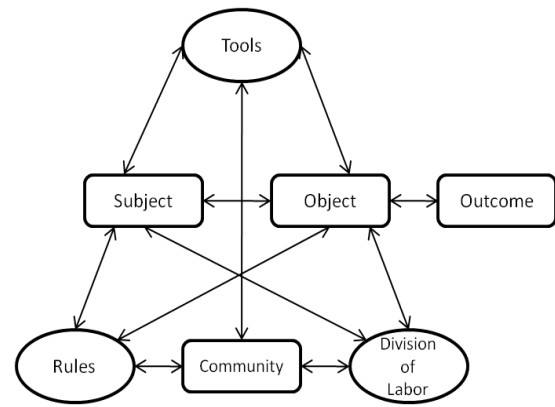


Figure 1: Activity theory components.

Object	Development of healthy, well-adjusted teenagers
Subject	Parents
Community	Parents, schools, teachers, government
Rules	Technology curfews, location, frequency
Tools	Monitoring software, browser history, cell phones
Division of labor	Parents, schools, teachers, government

Table 1: Activity theory components for technoparenting.

expectations set by parents regarding how children should use the technology (e.g. texting during dinner).

Division of labor breaks down the responsibility of monitoring and managing teens’ technology use into relevant stakeholders such as parents, teachers, or lawmakers. The concept of divided labor has a long history in economics, which has focused on specialization of skills for workers and productivity. Dividing work into subtasks enabled a more productive whole. However, people may disagree about how labor should be divided or how much authority is assigned to various positions, causing conflicts within the activity system. When kids behave inappropriately at school on their own cell phone, who is responsible? How about if they use a school laptop at home (or even a personal computer at home) on the weekend to bully a classmate from school? The issues are complicated and have become the subject of larger debates.²

A key property of AT is that all the components are related. People work together using tools, setting rules, or towards an outcome, and each component is mediated by the other components. A full explanation of AT is beyond the scope of this paper; see [14] for a detailed treatment.

METHODS

We recruited a sample of parents who were likely to have access to technology through contacts at a local school and

² See New York Times 2010 series, e.g. “Online Bullies Pull Schools Into the Fray” <http://www.nytimes.com/2010/06/28/style/28bully.html>

word of mouth. The average tuition at the school we recruited through is over \$20,000 per year, and a relatively small percentage of students receive financial aid (about 7% of total tuition owed). Attendance at Christian chapel for all students is mandatory. We did not ask participants their religious or political view; however, some of these came up during the interviews and among those, participants leaned towards Christian and Republican. In general, parents did not suggest that they were early adopters (e.g. waiting in line to buy an iPad) but they were economically able to buy new technologies. Our sample is non-representative and was selected to add depth and nuance to a rich description of one sub-group.

We conducted interviews with 2 fathers and 14 mothers during the winter and spring of 2010. The 16 participants (none of whom were related) had a combined total of 41 children. Each parent had at least one teen and most had more than one. Each interview was conducted in person at participants' convenience, in their homes, at their child's school, or at local coffee shops. Interviews were recorded and transcribed with permission. The length of the interviews ranged from 40 minutes to 1.5 hours and averaged just over one hour. Asking parents about their parenting abilities and struggles can be sensitive for the parent. To mitigate social desirability in their responses we structured our interview protocol to begin with conversational stories about their children and what they liked to do online. As the interview progressed, we moved toward more personal questions like what kinds of rules had they set, whether their children were monitored and how, and the challenges or concerns with which they dealt. We also asked whether they thought schools and government should have any responsibility in children's technology use.

We used a grounded theory approach to analyze our data [17]. Transcripts were coded for mentions of technology use and of parenting. We sorted by themes and coded for intersections between teen technology use and parenting. The formal data in this paper is based on the interview study; however, we have conducted over 10 focus groups and informational sessions with groups of 5-60 middle school and high school parents and have spent hundreds of hours over many years studying youth behavior online. The work and insights here builds off those experiences.

RESULTS

As teens adopt new technologies and communication practices, parents' activities are transformed along a number of dimensions. The following sections are structured around rules, tools, and division of labor using an activity theory framework. Each section highlights key themes in the interview data and frames results in a broader context of new information.

Rules: Norms and Expectations for Technology Use

Parents set rules based on time of day, frequency of use, and location of use. Parents set more limits on their preteens and young children than on older teens. Middle

Participants		Participant's Children	
Mother	14	(Total) Girls	22
Father	2	(Total) Boys	19
Family size		Children's Ages	
1 child/family	0	<8	7
2 children/family	2	8-11	9
3 children/family	7	12-17	17
4 children/family	4	>18	8

Table 2: Participant demographics. Individual family structures have been aggregated to maintain privacy.

school parents told us that the sixth grade was when their child began complaining that everyone else had cell phones. "If you ask her, she's the only one in the world without a cell phone." Sixth grade parents asked us to conduct a survey of other parents on how many of their children actually have cell phones in the sixth grade (we have incorporated this and other large scale surveys into long-term study we are currently running).

Time of Day

Parents of preteens more regularly enforce rules about evening use. Parents of older teens feel it is difficult to enforce these rules. W14's son likes to play Xbox on the weekends and she suspects he also plays it at night after she is asleep. However, she noted that he is an athlete and practices eight times a week with some early morning practices, so he "just can't play as late as he probably otherwise would." Some parents proactively enforce cutoff times in the evening; others ask their children to stop and hope the rules are mostly being followed.

"We have a cutoff at our house, a blanket rule. The phones and computer come down at 10pm and they have to leave it downstairs. And if they don't bring it down then the Internet is cut off. After 10pm? They can go to sleep! Or study. We've had that rule forever." -M10

"Yeah, I check the time; what in the world do you need to be talking about after 11? Sleep is important for me, for my children, it's important for my husband; you can't call our house after 10 at night." -W14

Frequency of Use

All 16 parents said that frequency of cell phone and Internet use is a hard problem for them. Some are very concerned, others do not like it but let it happen, and some simply note that use is high and want to know what our opinion is.

"It [number of texts] was close to 6,000 in a month, and the issues you always have to justify with your child when you're having this debate. They say yeah `but dad when I send out a message saying meet me at the movies, 30 people all write back at once.'" -J3

"When we go to a sporting event, our intent is to go and watch the event, I found that her peers would go to a

basketball game and would sit there and play on their iPhones the entire time. I find it's a distraction." -T27

T27 is strict about media time. She allows her children (age 11 and younger) 30 minutes a day and maintains a time card system where they have to "purchase" their media time from her. Good behavior buys more media time. T27 does not like her son going to friends' houses and playing Wii for three hours but she lets him enjoy this "reprieve" from her rules. M8 does not like her children texting or surfing late at night, but decided not to take away the technology because she does not want to "micromanage."

We were surprised that parents did not mention technology-sharing tensions at home. This finding was different than those in prior work, which presented it as an interesting problem [18] that could become heated and require regulation from parents [16] (although [7] reported that families liked sharing in their study). Our results may be in part because participants are more likely to be able to afford laptops and cell phones for each member of the family as children grow older, so sharing is not necessary.

Location of Use

All participants mentioned location of use, especially around the home. Again, concerns and rules vary widely; some require that technology be used in public places at all times while others allow complete freedom.

"They have to keep their computers downstairs. Same with cell phones. Our playroom is sort of at the center of our house. So they have a study desk; that's where they do their homework. I have to walk through that to get to the door. It's right outside of the kitchen; it's not that I'm hawking them but I can see what they're doing all the time." -S11

"I love the idea of having the computer in one stationary place in the house. I think that's very important; it's always been in the kitchen, always, always." -W14

W14 lets her son take his phone to the room but not all the time; she "would not be cool with that." K4 has not set location rules but notices her son upstairs on his laptop for long periods and wonders if he is really working or just emailing and chatting. H3's son had gotten in trouble online, at a time when the computer was downstairs in the basement and was not being monitored. Most parents wonder about how and when to set location rules.

"I think the next generation will have a clear set of rules. We're all trying. One my sister uses which I wish we had started and I could put in place now is no cell phones upstairs from the day they get them. When my 14-year-old is in exams and supposed to be intensely studying we'll try to keep the phone out of her room and it's a constant battle." -J3

"You've seen how much is going on around the house; how do I expect them to sit around the kitchen table and focus? I mean I can't focus." -H4

Location of use is a predictor of parents' ability to monitor; if the computer is in a public place, parents can observe it in use. H3 simply checks the computer itself sometimes. H3 had asked his son to stop playing Duke Nukem and put it in the trash on the computer.

"I came back a week later and it was on the computer again. And he said 'well you left it in the trash.'" -H3

No parents said they use GPS to track their child's location. However, many households have one stay-at-home parent who may be able to more proactively monitor the child. Parents reflected on the changes in the privacy of cell phone uses, like texting under the bed at night, compared to their own experiences with "appliance models" [7]. An appliance model is a device that allows anyone in the home to use the technology and that relies on social protocols to mediate sharing of the item, such as a shared landline. This is contrasted with a "profile model" where devices support multiple users who are asked to identify themselves. J3 remembers going back to school from summer break and the phone would be off the hook with his friends calling. Now there is dead silence, he noted nostalgically: "One of the shames of it is that you don't get to talk to the kids' friends anymore unless they come to visit."

Tools: Monitoring and Managing Technology Use

Parents monitor their children's Internet use by requiring password information or requiring that they be Facebook friends. Some parents are heavy-handed, monitoring all use and even forwarding their children's email to their own inbox without the children knowing. Others are more hands-off. They periodically ask their children what they are doing, but admit their children could be engaged in inappropriate activities or in trouble and they would not have any way of knowing. Most parents do not check monthly cell phone bill logs to see how often or with whom children are texting. This may be in part because it is easier to enforce rules real-time rather than post-hoc at the end of each month.

"Just like we would monitor what book they read or movie they watch, we monitor what they do on the computer. I have her password; she gives it to me." -T27

"I go in his room and say computer off and then I check back and usually he has done it and if he hasn't then this one time I just took the computer. And then 'Mom!'" -K4

"They think I can read all their emails; I've told them that I can. I don't know if doing it helps at all. I've said that your school as well as your mom and your dad can go back and check anything that you send or do online. So you need to double think everything you do." -S11

Parents who tried blocking strategies such as filtering and parental control software found them burdensome and ineffective (and such authoritarian approaches are known from other research to invite circumvention [8]). W14 set up a child safety tool but then "nobody could search anything and I thought 'this is a dumb idea.'" W14 also finds searching history cumbersome. She and her son both

have Dells but the process of searching history is different on his computer. W14 nonetheless feels confident about her success as a parent (she has three grown children and one teen) and remarked that she and her youngest son have a long-standing joke about her inability to play *World of Warcraft*. J3 has two laptop logins for his daughter. One has fun applications (e.g. Facebook, chat, etc.) and a timer. The second has only work-related applications and no timer.

Technical Competency

One of the challenges parents report is that they do not always understand and know how to use the technology their children are using. These gaps in technical competency can be disruptive. Parents' gaps in technical expertise—or the perceived gap between parent and child expertise (see [20] on “digital natives”)—undermine parental authority. For example, it was difficult for parents who had never used chat to imagine what kinds of uses their children might find with it, and how to set rules around these possible uses. Many of the difficulties parents report can be predicted by their levels of technical expertise. Parents who are technically savvy describe more questions about deciding *what* rules to set and battles to fight; parents who are less savvy want to know *how* to set rules and enforce them. Of the two fathers interviewed, one is very tech savvy and one is moderately tech savvy. The mothers we interviewed range in technical ability and interest but none self-describe as heavy technology users.

“I knew you were going to ask this. My friend has got the program, I don't know what it's called. She says I should get it but I can't even read my own emails, much less my kids'. I would say I'm more technically behind than my friends... My kids know more about their cell phones and computers and anything tech than I do, more than their father does. They know that they do.” -S11

“You're going to have to forgive me because I'm not going to use the words correctly. I just don't understand it, that's the problem with it, I don't understand the way they communicate.” -W4

Among all parents there is a general awareness that they cannot monitor or control everything their kids are doing. S10's husband said their daughter could have Facebook if S10 asked for her “code...what is it called?” (though their daughter has subsequently joined Facebook and S10 has not yet gotten her password). S10 does check history on her children's laptops. She learned how to do this at the Apple store, initially not as a disciplinary tool but because she was trying to find something on her laptop. She appropriated it for monitoring because “It's so easy to go on there, and you hit the button and everything shows up. I love that.”

One medium that parents have adopted to keep up with their children is texting. Parents learned to use text messaging because they perceive it to be the best—and sometimes, only—way to get a timely response from their teens. M3 texts her children when they are in the shower because it is the fastest way to notify them that it is dinner

time. Parents text their teens in the evening because teens can text back discreetly while out with their friends. Many parents leverage cell phones and the Internet as a privilege they can take away as a form of punishment.

Division of Labor: Who's Responsible?

In an activity system, division of labor describes how tasks are distributed within the system. Parents desired a community-oriented approach to managing and monitoring technology use. While parents feel it is ultimately their responsibility to parent their child in all aspects of life, they have varied views on the roles of schools (e.g. teachers and administrators) and government (e.g. texting laws) in the technoparenting process. The division of responsibility for monitoring and managing children's technology is complicated. This section describes parents' perspectives on the distribution of labor among parents, school, and government.

Parents

Digital footsteps can leave permanent, archived traces. Parents worry their children are going to say something or get involved in a conversation that can have devastating consequences. During one school incident, a student emailed an exam to other students and even the recipients who read it and didn't report it were punished. A sexting incident at a school also had parents of older teens concerned about their dating behavior and the kinds of photos that might end up online.

“I overheard my son's friend say to him, 'I saw a picture of your sister on Facebook; she and her friends were holding beers.' I couldn't breathe! Not so much because of the drinking though I didn't like that either, but just because of who could see that. I'm worried about who's seeing it more than that she's doing it.” -S10

“You hear these things about kids who get in trouble, like sexting. If that were my kid I would feel I was partly to blame because I wasn't monitoring it. It's my kid, they're in my household, and they're young. It's my right to know what he's doing on the computer and I probably should be more on top of it.” -K4

“My daughter joined Facebook last year and immediately posted 'I hate school with a burning passion.' It's funny now but at the time I told her, 'you're friends with your teacher, your chaplain; what do you think he thinks when he sees this?' So I think that it just made her think more about posting.” -K4

Parents note that many of these fears are different and perhaps greater than those of past generations because of the permanency. They recognize that their children are developing and likely to make poor choices through adolescence, but feel the repercussions are more drastic.

“My husband is worried about potential damage it can cause for their futures. Just one mistake with drinking or drugs on the computer can blow your whole...how one little mistake can have a long-term effect.” -S3

“What goes into their head comes out their mouth and out their fingertips. When you write something, it’s permanent. I think that’s the biggest downfall.” –W14

“When I was in 7th grade if you wanted to see a girl’s bosom you just went behind the bleachers and the girl would flip up her shirt and show her bosom. This year, she texted it to him; everybody gets in trouble.” -S11

Parents relied on older siblings and extended family to keep an eye on their children’s Facebook use. While some children did not want to friend their own parents, they were willing to friend extended family members. They also relied on other parents—or the possibility of other parents being on the receiving end of their own child’s communication—to try to encourage appropriate uses.

School

Frequency of use is problematic at school as well as at home. Students wear hooded sweatshirts with front pockets and text in their sweatshirt pockets without looking at the cell phone, a practice which they do often and do well. The school has a rule of no cell phone use in the building and students look for creative ways to circumvent rules. (This also led the school to ask parents *not* to text their children during the day because it creates a tension in authority between parents and school policies.) Parents feel that if the school administers laptops to students as part of a school program then the school should be responsible for monitoring what the students are doing on it, both at school and at home. Many parents wonder if the school actually does monitor students’ use of the laptops.

“My first response is yes, they should monitor it. My second response is they don’t have the manpower. I mean as a mom, it’s hard enough to keep up with my kids’ two laptops... I like the kids thinking that the school is monitoring it even if they aren’t but I also think that ultimately it’s my responsibility.” –M3

“The kids probably think that they’re monitoring it more than they are which is fine. I’m like ‘anything you send or receive on this, the school’s watching,’ although I don’t think they really are.” -H4

“My prayer is that the school is ahead of the game instead of behind... I want them to be taught age-appropriate training on the computer. But I don’t count on them to teach my kids the things I think I should be teaching them.” -G7

Some parents feel it is a shared responsibility among parents and teachers:

“For computer ethics as well as moral ethics, I think teachers have a huge responsibility. Parents too.” –K4

Although parents are not sure if the school is monitoring their children’s use (either at home or at school), they like the idea that the school *could* be. In particular, they like the idea that their children *think* the school is monitoring them.

Government

Most parents are less enthusiastic about the idea of government monitoring their children, feeling that it is parents’ responsibility to oversee their children. Government trying to compensate for bad parenting does not help. However, some parents agree it could help to have laws to discourage kids from doing something they shouldn’t be doing. S11 questions whether government can effectively put restrictions on children when they cannot do it effectively with adults and pedophiles. J3 is most positive about government regulation:

“I really do believe that the government should regulate because once regulation is set up, you have boundaries, you have clear rules on how it is allowed to be used... I think all things around content should be regulated, absolutely. It’s too easy for kids to get to this stuff. I don’t believe that self-policing in this case works.” –J3

In general, more conservative parents tend to reply that parenting children is a parent’s responsibility whereas more liberal parents are also open to government regulation. As mentioned earlier, the demographics of the interview subjects lean toward conservative and religious, which likely influences responses about regulation. These results differ from [8] and suggest room for future work.

Summary

Table 3 shows a subset of key rules, tools, and stakeholders parents reported in the interviews. The results indicate the wide range of challenges and issues and tensions that parents grapple with. Some want to wield more control over their children but don’t know how; others know how but find it to be a constant battle to enforce rules and keep up with changes in technology. Still others are unsure what the right balance is between control and independence, and privacy and safety. All parents want their children to be happy and healthy and progressing normally. However, societal norms are unclear and set few standards or expectations from which parents can take their cues.

Limitations

This was a non-representative sample. We wanted to control for variations like financial hardships and dysfunctional family dynamics. This also meant the families were generally economically able to purchase technology for their children, if they decided to do so. We are currently conducting a second study with racially and ethnically diverse parents and with single-parent or other traditionally non-normative family structures. We suspect some parenting challenges and approaches will be shared across families; others will differ by socioeconomic status and culture. In future work we are also including teen attitudes and comparing teen and parent perspectives.

DISCUSSION

The results show the myriad ways that the activity of “technoparenting” is transformed with changes in social media use. As children grow into teenagers, parents tend to lift the limits, or more likely, simply stop enforcing them as the battle with the teen becomes overbearing. For a long

Rules Parents Set	n
Technology use based on performance (e.g. grades)	14
Establish etiquette rules (e.g. no texting at meal times)	9
Limit minutes of media time per day	6
Walk into child's room to monitor use	6
Take away technology as punishment	6
Personal technology must be kept in public	5
Evening curfew for technology use	4
Tools Used	n
Check browser history	5
School's monitoring software (number of mentions)	5
Install parental control software	4
Require Facebook friends	3
Require passwords be shared	3
Purchase texting plan with evening cutoff	2
Division of Labor: Who is Responsible?	n
School administration	9
Teacher	8
Older siblings and other relatives	7
Other children's parents	6
Government	5
Coaches, pastors, etc.	2

Table 3. Parent rules, tools, and perceptions of community roles. n=number of participants.

time our research has been motivated by the belief that people—including children—have agency and ownership in their use of technology. Yet our results here and others' suggest more nuance is needed [32]. In the same way that parents dictate children's sleeping, eating, and playing patterns, there is a need for deep guidance of technology use. For children, we want to support parents' desire to monitor and manage their children's social media use. For teens, we want to support authoritative parenting practices [31] while respecting teens' growing personal domains.

Social Norms

Parental monitoring predates technology. In the Victorian era, courting took place at the girl's home under the watchful eye of her parents. A single girl was never allowed outside of the house by herself, particularly not in mixed company. However, social norms and expectations evolve with societal changes. Our results describe ways that social order is disrupted as rich new communication tools are brought into the home. When norms change, components in the activity system change in response. Future research should further examine changes in norms and etiquette as social media and technology fade in and out of fashion.

How much is too much?

Parents sometimes take away or limit technology as punishment or reprieve. We as a society know little about what the right balance is for children and technology use. Whereas topics like bedtime, mealtime, and playing outside have generations of precedence, activities like texting in bed, surfing a smart phone during meals, chatting while studying, and playing video games do not. Developmentally acceptable norms change, making it difficult for parents to know when to acquiesce to requests for individuality and self-regulation, and when to squelch them. It is also difficult for parents to explain why rules are set the way they are when parents themselves may not know.

Politics of Technoparenting

Parenting is not democratic and there may be little end-user control built into digital systems from the perspective of the child. Czeskis, et al. [9] described the tradeoffs in safety versus privacy in mobile device monitoring technologies for parents and children. Technical arrangements and social order work on built-in assumptions about parent-child relations and power imbalances. This resurfaces familiar questions about child rights; in particular, do children have a right to privacy? What are the tradeoffs between control and autonomy? Circumvention and freedom? Supervision and surveillance? To what extent does technology fall under teens' own personal domain? Should empathy and compassion be a component of technoparenting? The answers are beyond the scope of this paper but should be considered in designing systems to support parents.

Design Implications

We present design ideas for a conceptual digital window based on ideas of social translucence. Social translucence is an approach to designing digital systems that emphasizes making social information visible within the system without making information fully transparent [15]. Erickson and Kellogg's ideas for social translucence were to support workplace interactions through visibility, awareness, and accountability [15]. Yet, many of their ideas translate to the home. Translucence suggests that social information can pass through diffusely, allowing significant information to be surfaced but filtering out private details that carry little additional information. We want to surface visibility to parents without compromising agency and autonomy that children need to develop into self-dependent adults [31].

Awareness Asymmetries

One way for a digital window to enable awareness is by surfacing relevant information through social activity indicators [2]. However, awareness can be asymmetric [41]. Some parents want their children to know their online behavior is being watched; other parents want to watch surreptitiously, waiting for children to make a mistake and expose a "teachable moment." In [15], it was important that people were aware of the existence and nature of the constraints, and that people were aware of *others'* awareness of the constraints. Much of the parenting process involves simply watching children and making sure

children *know* they are being watched, in order to motivate desired kinds of behavior. Technologies that display Internet activity in the home in a centralized location might empower both parents and children.

Social Presence and Privacy

Parents want visibility in the technology their children use. Activity indicators and awareness cues can be built into a digital window to surface socially salient information [2], such as when kids are using technology and who they are using it with, and to trigger unusual behavior (like late night chatting or language that parents deem inappropriate). Care should be taken when designing a digital window that it strikes a balance between parent authority and child autonomy. “Just as in shared physical spaces—seeing that two people are chatting (without knowing what is said) can convey useful information without necessarily infringing on their privacy [15].” Not surprisingly, children don’t want to share their passwords with parents [8]. We might design a remote chat monitor application that stamps when children are Instant Messaging or Skyping and who with, but does not record chat information itself.

Place and Space

The architecture of a digital window for “technoparenting” has analogues in the physical architecture of the home. While mobile technologies have changed the conceptual nature of “space,” as articulated by Harrison and Dourish [21], some properties of the home are still very much locked in place. Parents can see when friends come and go and who the friends are. Earlier generations of communication technology—like shared landline phones in the kitchen or a family TV in the living room—enabled much of this visibility (although circumvention was common, e.g. dragging a shared landline cord into the closet). Cell phones and laptops are personal and private [22]. New designs might include features that include geolocation and sensors that locate appropriate uses in various places in the home.

Supporting Unique Values and Approaches to Parenting

Recall that authoritative parenting—where parents are both demanding and responsive—is the recommended parenting style [31,40]. However, approaches to parenting vary by family values and culture. Some parents in our study tend towards heavy-handedness; others prefer to let their children make mistakes and learn from them. Parenting approaches may also vary with political and religious alignment. New designs should be adaptable to different parenting styles and might include settings that allow parents to dial up or down the kinds and amount of technology use that their children can engage in.

Broader Issues

Mounting concerns about multi-tasking, addiction, lack of physical movement, poor relational development, and underdeveloped communication skills all contribute to a generally shared sentiment that some amount of respite from technology is desired and needed [42]. Adult use of social media has also increased rapidly. It is reasonable for

parents who use a smart phone at the dinner table to expect that their child will mimic this behavior. Other work has suggested that mechanisms to force desirable behavior and respite from technology—such as observing the Sabbath—can be beneficial [41]. The question that could arise is why bother with technology? Why not block technology until children are 18? Numerous studies support the ways that technology can help children learn, play together, build creative skills, and socialize [4,22]. Technology opens avenues for increased parent-teen interaction. Parent and teen social spaces overlap in new ways (e.g. Facebook). Thus, the ideas put forth here are socio-technical. Technology alone will not make poor parents become good parents. Parents and children need to learn to make informed choices. Our overarching goal is to support and teach parents and children to become stewards of their own technology use.

CONCLUSION

Technology is pervasive and families are using technology in their daily lives at unprecedented levels. Parents should set rules and use tools in ways consistent with their own family values. There are opportunities for designing systems that support authoritative parenting practice and for helping parents develop technical competency. This has implications for future work in system design, policy, social etiquette, and education.

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