

Abandoned but Not Forgotten: Providing Access While Protecting Foster Youth from Online Risks

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ABSTRACT

Teens in the foster care system often have histories that involve severe trauma, such as physical and sexual abuse, substance use, incarceration, and early pregnancy. While studies have investigated foster teens' engagement with high-risk behaviors offline, there is a dearth of information regarding foster teens and their engagement in online activities that may facilitate increased risk behaviors. Moreover, the extent to which technology acts as a positive versus negative influence on foster youth is unclear. We synthesize the current literature on foster youth and online safety to illustrate: 1) the tensions between providing access to networked technologies versus keeping foster youth safe from risks, 2) the lack of empirical research or technology-based interventions to ensure the online safety of foster youth, and 3) the importance of pursuing future research to design solutions that can alleviate some of these tensions. Our goal is to inform researchers, designers, and educators on the importance of keeping in mind the needs of particularly vulnerable populations, such as teens within the foster care system, when designing interactive systems.

Author Keywords

Adolescent Online Safety; Teens; Foster Care; Technology; Participatory Design.

ACM Classification Keywords

K.4.1 Computers and Society: Public Policy Issues.

INTRODUCTION

On a given day, over 400,000 youth reside in the foster care system within the United States, and approximately 30% of these youth are aged 13 to 20 [54]. Many of these youth experience a multitude of traumatic events in their lives. Nearly 80% of foster youth have had at least one adverse experience related to parental divorce, death, domestic violence, or family drug addiction with almost half (48.3%)

experiencing four or more of these traumatic events before they reach adulthood [7]. Research has consistently confirmed that youth in foster care are susceptible to higher levels of risk than those who are not in foster care and have more detrimental outcomes due to their risk experiences [39,40]. However, very little research has examined the influence of networked technologies (e.g., social media, mobile smart devices) on foster youths' risk behaviors, adverse experiences, or negative outcomes [3,22].

In terms of adolescents in general, we know that technology currently consumes a large portion of teens' lives. According to Pew Research, more than half of the teens in the United States report going online multiple times a day, if not constantly being connected [1]. The prevalence of technology use has been shown to expose teens to a number of online risks. For instance, one in four teens will unintentionally be exposed to sexually explicit materials online [37]. Understanding these potential risks has motivated researchers in the Interaction Design and Children (IDC) conference and the broader HCI community to study effective methods for keeping teens safe from online risks [2,4,21,29,48]. Some suggestions include building trust through discourse [29], emphasizing teen resilience [48], and moving toward design solutions that promote active parental mediation [34] and teen-self regulation, as opposed to solutions that are privacy invasive and reinforce restrictive parenting practices [47]. However, such recommendations may not be generalizable to foster youth as they are a particular vulnerable population of teens.

In this paper, we draw from existing literature to argue that researchers and designers will likely need to conceptualize different approaches when studying and developing interactive systems so that they meet the unique needs of foster youth. We do this by synthesizing research regarding the high-risk offline behaviors of foster youth, research that pertains to foster youth and technology use, and, more generally, adolescent online safety literature as it relates to other vulnerable teen populations. Overall, we found evidence that foster youth are particularly susceptible to both offline and online risks, though very little research has empirically examined the role technology may play in exacerbating or mitigating such experiences on or offline. Based on our findings, we urge HCI researchers and interaction designers to engage with foster youth and other

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vulnerable teen populations to find solutions for providing access to networked technologies that can benefit the teens while protecting them from severe online risks. We recommend specific areas for future research on adolescent online safety for foster youth and outline some of the challenges we may face as we engage with foster teens.

BACKGROUND

First, we situate our research within the IDC community, researchers and practitioners focused on designing technology to improve children's well-being, as a response to the call for more interaction design research with adolescent populations. We then relate interaction design for adolescents to online safety research and expand our background literature to discuss two themes that have emerged within this broader subject area: 1) online safety through increased parental mediation and 2) empowering teens to protect themselves online. We discuss how these themes may not translate well to foster youth and show how our work contributes to the existing literature.

Interaction Design for Adolescents

In 2011, Yarosh et al. [53] conducted a nine-year review of articles published at IDC and concluded that more of the research had focused on younger children (ages 6 to 12) than adolescent populations (ages 13 to 17). These researchers recommended that IDC expand its focus to investigate other adolescent populations and their unique needs. As a result, more IDC researchers began examining the special needs of teens [31], as well as the methodological challenges and best practices of conducting interaction design research with adolescents [42]. When discussing interaction design in the context of adolescents, online safety becomes a central concern as we want to allow teens to engage through technology beneficially but also want to protect them from harm [29]. As such, we believe the tension between trying to mediate teens' online behaviors to protect them versus trusting and empowering them to protect themselves should be explicitly addressed when designing interactive systems to achieve such goals.

Adolescents Online Safety through Parental Mediation

Quite a bit of interdisciplinary research has focused on the topic of adolescent online safety and risks. For example, researchers have studied the prevalence and factors that are associated with online sexual solicitations and sexting [37,44], as well as exposure to pornography or other explicit materials online [9]. One common theme within this literature is an emphasis on effective parental mediation strategies for reducing these online risk exposures [4,10,16,47] and understanding adolescent online safety from the perspective of parents. For example, Blackwell et al. [4] found that parents felt frustrated and anxious when they were unaware of the activities in which their children were engaging in from their mobile devices. They recommended parents have open dialogues with their teens to provide a channel for understanding and establishing mutual expectations [4]. Other researchers have also recommended approaches that promote online safety

through engaged parental mediation and trust relationships [29,34].

Unfortunately, more recent research has found that many of the current solutions for online safety, particularly in mobile contexts, tend to focus instead on more authoritarian parenting approaches of restriction and monitoring [47]. This may be problematic because overly restrictive parenting practices can suppress positive online experiences their teens have online, as well as the negative ones; more engaged parenting, on the other hand, can empower teens to cope with risks so that they can benefit from being online [49]. Still, family communication regarding teens' negative online experiences is often poor and teens do not feel comfortable discussing their online experiences with their parents [50]. So even within typical family settings, parental mediation approaches for ensuring adolescent online safety are still works-in-progress.

Empowering Teens to Protect Themselves Online

A recent and alternative approach within the adolescent online safety literature involves moving away from parental-focused online safety strategies to ones that empower teens to cope with and be resilient to the online risks they may face [47,48,50,51]. For instance, a two-month long diary study with 13 to 17-year-olds suggested that most of the online risk experiences teens encounter are unintentional, and teens can largely cope with these experiences to resolve them on their own. These risk experiences may actually help teens develop important interpersonal skills, such as conflict resolution and empathy [51]. boyd et al. [6] further explained why teens should be empowered to take control of their safety online. The internet is inherently part of a teen's life and reveals the struggles teens face not just online, but offline as well. Therefore, by providing teens with the proper navigation tools and avenues of communication, they will be able to overcome many of the negative online experiences [5].

As a result, some researchers have attempted to empower teens to meet their own online safety challenges through design. For instance, Ashktorab and Vitak [2] used participatory design techniques with teens to develop solutions to prevent online harassment and cyberbullying. They found that teens appreciated the opportunity to get involved in designing solutions that positively affect their peers and their own well-being, as well as the chance to work with adults as peers. Such research shows the importance of providing teens opportunities to engage with HCI researchers and designers. Having more agency and responsibility in the design process can encourage teens to place more value on engaging online safely.

Adolescent Online Safety of Foster Youth

A literature review on adolescent online safety, also published at IDC 2017, found that the few design-based interventions exist at all, and those that do are focused on promoting more collaborative practices for parent-teen rule-setting behaviors [41]. To date, the main stream literature

on adolescent online safety has not examined the unique situations of foster youth as it has predominantly focused on teens in general. Nor has it posed the possibility that promoting parental mediation and teen empowerment may not be generalizable to more vulnerable populations of teens. For instance, youth within the foster care system do not have traditional family units and, consequently, conventional parental mediation strategies, which require a relational bond between the parent and child may not be possible [3]. Further, this subpopulation of teens is already considered high-risk due to their long-standing difficulties.

Foster youth may lack the developmental maturity and resilience to appropriately manage unmediated access to technology [52], much less highly negative online risk experiences [3]. At the same time, foster youth could greatly benefit from the social support and resources provided by having access to internet-connected technologies [27]. The organization iFoster [55] has estimated that less than 21% of foster youth have access to home computers, compared to 90% of the general teen population [1]. Thus, foster youth may require additional support to remain safe online without restricting access to beneficial online resources. With this in mind, we critically examined the current literature around adolescent online safety and foster youth in order to build the case that more research needs to be done in terms of interaction designs to promote the well-being and safety of foster teens. The end goal being to increase their access to networked technologies without putting them at even greater risk. Thus, we make the following research contributions:

- We synthesize interdisciplinary literature related to foster teens and offline risks, the online safety of foster youth, as well as the unique challenges of other vulnerable teen populations as they engage with and through internet-connected platforms.
- We illustrate the lack of research related to the online safety of foster teens, effective strategies for supporting foster parents in mediating technology use, and design-based interventions for promoting online safety.
- We recommend avenues for new research and suggest leveraging participatory design approaches with foster youth to engage them directly in developing practical solutions to provide access to technology while minimizing potential harm.
- We present some of the ethical and legal challenges HCI researchers and designers may face as we move forward with this proposed research agenda.

METHODS

Due to the novelty of our topic, we first chose to conduct a comprehensive review of the literature related to foster teens and their online risks to synthesize themes around three main topics: 1) foster youth's high-risk behaviors and outcomes, 2) foster youths' online safety and technology use, and 3) more generally, online safety of vulnerable populations of teens. To identify relevant research across

multiple disciplines, we first searched a diverse set of digital libraries, which included the ACM Digital Library, PsychInfo, ProQuest Education, and ProQuest Sociology. After these searches were exhausted, we used Google Scholar to conduct a broader search to ensure inclusivity and multidisciplinary perspectives. We also cross-referenced the citations of each article to identify any additional articles that should be included. The following search terms were used within the search criteria for each of our three main topics:

- 1) **Foster youth susceptibility to offline risks:** "foster care," "adolescents," "teen," "youth," "risks," and "challenges."
- 2) **Foster youth and online risks:** "foster care," "adolescents," "teen," "youth," "technology," "social media," "online safety," and "online risk."
- 3) **Vulnerable and "at-risk" youth online safety:** "at-risk," "vulnerable," "adolescents," "teen," "youth," "susceptible," "technology," "social media," "internet," and "online safety."

We searched specifically for articles that were peer-reviewed and published between the years of 2006 and 2017. An initial analysis was performed by reading titles and abstracts to identify relevant articles and remove irrelevant sources. Note that we performed the third search on vulnerable youth and online safety after we found so few publications that were related to foster youth and technology use.

SYNTHESIZING THE LITERATURE

Overall, we found extensive research in the areas of foster youth and offline risks, as well as online safety for vulnerable or at-risk adolescents. Of the literature found, we summarize the 20 most relevant sources for these two topics. In contrast, little research was found specifically at the intersection of online safety, technology use, and foster youth (only 5 articles). Therefore, we summarize the findings from all articles we identified within this topic. We summarize the literature related to these three topics below and provide key themes across the literature.

Foster Youth as a Particularly Vulnerable Population

We define vulnerable teens as those that have encountered previous harms and are thus more susceptible to future harm [52]. Research has confirmed that teens within the foster care system report higher levels of risk and harm compared to other teens. As such, researchers have investigated foster youths' extreme vulnerabilities to health, developmental, social, and emotional risks. For instance, foster youth are more susceptible to detrimental outcomes, such as substance use [39], poor health [19,26], and early pregnancy [40]. For example, Gramkowski et al. [26] found that approximately 43% of foster youth reported being sexually active compared to 34% of a comparative teen sample. Oshima et al. [40] used a longitudinal study design and discovered that over 50% of the foster youth became pregnant before the age of 19.

Shpiegel [45] suggests that foster teens are also less resilient to risks when they have a history of physical or sexual abuse, placement instability, and delinquency. Other risk factors that have been found to contribute to negative long-term outcomes include child maltreatment, school transitions, and child welfare factors [38,40,45]. In contrast to studying the high-risk outcome and risk factors of foster youth, some researchers have also studied the protective factors that help these teens succeed and live healthy lives. Salient factors include intellectual ability, educational attainment, religiosity [38,42], social support, extracurricular activities, and types of supportive environments [30,38,40,45]. These protective factors have been shown to counteract negative outcomes, such as teen pregnancy, homelessness, mental illness, substance use, and criminal involvement [18,32,40,45]. Additionally, quite a few studies focused on older teens transitioning into adulthood or “aging out” of the foster care system [19,38–40,45]. These studies emphasized that the risks and problems foster teens faced in their youth follow them into adulthood. Studies suggest that many of these teens lack the proper skills and knowledge to live independently, such as not having a high school diploma [33]. Due to their lack of access to technology, many foster youths lack the ability to perform basic tasks, such as searching for a job online [55].

Benefits vs. Risks of Technology Use by Foster Youth

We identified five articles (recently published between 2015-2017) that discussed youth in foster care in combination with technology use or online safety. An overall trend we identified was that the articles represented a spectrum of perspectives, from the benefits of technology use to the potential risks associated with it. Given the lack of research in this area, we give a detailed summary of the findings from each of these emerging studies below, focusing on the trade-offs between benefits and risks.

Gustavsson and MacEachron [27] were the first to take a digital perspective of foster youths’ development by exploring the benefits and potential risks associated with internet use by applying positive youth development theory (PYD). For example, they found that the internet can serve as a means for foster youth to find an immense amount of information on topics of personal importance (e.g., medical health, employment, school work). Access to technology also provides foster youth the ability to build social connections and receive social support. Yet, the internet may also expose them to false, offensive, or threatening information that could cause harm. By implementing the “five Cs” of PYD (i.e., competence, connections, confidence, character, and caring), the researchers offered policy-level suggestions for supporting foster youths’ safe internet use. For example, policies should cover ways to mitigate risks and enhance competency of healthy online practices for foster teens. Ultimately, they advocated for involving foster youth in the strategies to combat internet-related risks.

Fitch [20] created a framework for developing privacy guidelines for social media disclosures so that foster youth and their networks (e.g., case workers, foster parents) would not expose them to undue risks. Using Critical Systems Heuristics as a guide, this framework provides twelve guiding questions organized under the following four categories: 1) *motivation* – who the disclosures may benefit, 2) *power* – who has authority or the information, 3) *knowledge* – who is considered the expert on the topic, and 4) *legitimacy* – what is appropriate to disclose? The purpose of utilizing this framework was to include foster teens as stakeholders in developing policies that regulate their social media use. While Fitch advocated foster youths’ involvement in policy development, he acknowledged that this approach could open up issues of liability for foster agencies.

Denby et al.’s [12,13] DREAMR project sought to help foster youth develop healthy relationships through the use of smartphones. Using the relational competence framework, they hypothesized that enhanced communication with social service providers would serve as a protective factor against various risk outcomes. The researchers gave teens access to mobile phones paired with a web-based application. Using survey-based and focus group data to triangulate the experience through the eyes of the teens, they found both positive and unintended consequences of the intervention. Most teens found the smartphones to be easy to use, enabling them to develop a closer bond with their social service providers. However, 43% of teens were also frustrated with the program due to the restrictions implemented on the phones (e.g., limited contact lists). This prevented the teens from building a trusting and positive relationship with their caseworkers.

Badillo et al. [3] focused primarily on the unique challenges of foster parents of teens when it came to mediating technology use. They found the first empirical evidence that foster youth may be more susceptible to particularly risky online behaviors and experiences (e.g., sexting, sexual predation, elopement, and sex trafficking) beyond that of typical teens. Foster parents expressed multiple concerns for mediating the teens’ technology use with authority and control representing the most major issue. Foster parents felt they often did not have the right or a sufficient trust-relationship with foster youth to place boundaries on the teen’s technology use. Additionally, some foster parents tried to overcompensate for teens’ previous deprivation, resulting in teens having an attitude of entitlement. Nevertheless, the idea of constructing “normalcy” in the teen’s life by providing opportunities to engage with technology was very important for many foster parents, as they are aware that their teens have faced several childhood traumas. Yet, foster parents felt at a loss for how to properly mediate technology use, often taking an all-or-nothing approach by not mediating use at all to revoking technology access altogether.

To compare and contrast the literature summarized above, the first two studies were primarily policy focused, whereas the latter three included empirical evidence from foster youth and foster parents. However, all of the studies illustrated a clear tension between advocating for access to technology so that foster youth could benefit and addressing the need for protecting teens from undue harm from online risk exposure.

Online Safety of Vulnerable and “At-Risk” Youth

Considering the limited research at the intersection of technology use, online safety, and foster youth, we expanded our search to “at-risk” and vulnerable populations of teens. Broadening our search offers evidence for the importance of studying and designing for the unique needs of vulnerable teen populations, which include foster youth. Our search yielded literature on a variety of vulnerable teen populations, including those who are lesbian, gay, bisexual, and transgender (LGBT) [11], struggle with anorexia [24,46], have a diagnosis of attention deficit hyperactivity disorder (ADHD) or Asperger syndrome [35], or are homeless [17,28,43,52]. Similar to foster youth, many of these teens have been marginalized from society and struggle with adversity in their everyday lives.

These vulnerable subpopulations of teens have been found to face very difficult challenges associated with engaging online. Having culturally and societally stigmatized identities often lead teens to search for social support or relationships in online communities that otherwise are not available to them [11,24]. However, teens who suffer from anorexia nervosa, for instance, often fall victim to online threats due to disclosing personal details about themselves in online forums [46]. While online discussion forums have many benefits, researchers have found some community forums to be unhealthy. For example, in a pilot study conducted with patients suffering from eating disorders (ED) and parents, approximately 35.5% of patients used Pro-ED sites, communities that support and guide those that want to maintain their eating disorder activities. Over 70% of teens studied said they used weight loss websites, while 52% of their parents claimed they did not [46]. Similarly, individuals with ADHD, Asperger syndrome, or similar disabilities often find themselves at a higher risk of cyberbullying within online platforms [35]. However, their parents were also unaware or misinformed regarding their online experiences. About 73% of parents indicated their child had never been bullied, even though over 21% of the youth said they had been cyberbullied within the last two months [35].

Arguably, homeless teens may be the most similar population to foster youth for a number of reasons. First, many homeless teens have spent time in the foster care system prior becoming homeless [17]. They are also likely to not have a stable family environment, reporting a history of sexual and physical abuse, as well as family dysfunction [43]. Despite their housing instability, homeless teens still

access the internet frequently. Harpin et al. [28] found that over half (55.6%) of teens living on the streets of Denver accessed the internet regularly. Similarly, Rice and Barman [43] found that 72% of homeless youth in Los Angeles accessed the internet within the last two days of participating in their survey. While many homeless youths own their own cell phone (46.7%) [28], they also rely on free internet access, such as from public libraries and youth service agencies [43]. While these studies examined technology-aided interventions for homeless teens, they did not examine the associated risks of providing access.

IDENTIFYING GAPS IN THE LITERATURE

Offline Programs vs. Technology-based Interventions

We identified some potential limitations and gaps in the existing literature to help inform areas of opportunity for future research. First, most of the research on foster teens and offline risks offered solutions that relied on mentoring or relational nurturing to encourage positive psychological and behavioral outcomes among foster youth [36,38]. Unfortunately, many of these programs put in place to support the unique needs and circumstances of teens in foster care are underfunded, poorly monitored, and heavily influenced by politics [25]. This may be why the DREAMR researchers [12,13] have turned to study more technology-based interventions that help create the infrastructure for positive relationship building within foster youths’ existing social networks.

Few Empirical Findings related to Technology’s Role in Foster Youth Outcomes

The offline risk literature deeply examined the prevalence of and outcomes associated with different risk behaviors, as well as protective factors that helped to mitigate these high-risk outcomes. However, this literature did not examine offline risks in relation to online risks or how technology may influence different risk outcomes. For example, some adolescent online safety literature suggests that teens who have mobile smart devices expose themselves to more sexual-related risks [44]. Yet, this literature makes no mention of technology use and its influence on risk outcomes. Otherwise, the research conducted thus far on online safety and risks of foster youth has been largely theoretical or policy-oriented (i.e., no empirical data from foster youth) [20,27]. For example, focusing on the potential benefits of giving foster youth access to technology [3,12,13,27] or proposing policies for protecting foster youths’ privacy while online [20,27]. To date, no research has been conducted related to online safety and/or risks from foster youths’ own perspectives.

An Overall Lack of Knowledge regarding How to Ensure the Online Safety of Foster Youth

While foster youth are often identified as stakeholders in the policies designed to keep them safe online, more emphasis seems to be placed on the goals of foster parents or agencies who are charged to protect foster youth [3,12,13]. Researchers who performed a 40 year review of

research on out-of-home-care [36] found that priority, from an agency perspective, has typically been placed on increasing authority and control—there is a belief that if we restrict or limit, we are safeguarding teens. Interestingly, this mentality mirrored some of the prevailing perspectives we found in the adolescent online safety literature, which have been shown to be overly restrictive and, likely, ineffective [29,47]. So, then the question becomes: How do we ensure the online safety of foster youth?

Our review has shown that other populations of vulnerable teens face similar adversities as foster youth: yearning for belonging and positive connections; a history of trauma, sometimes in the form of sexual and physical abuse; and unhealthy relationships leading into adulthood [17,24,45]. We found a number of underlying similarities shared by these teens that could inform future research and design regarding online safety and risks for foster teens. For example, engaging in behaviors or communities online that intensify their serious behavior and mental health [24,25]. Suggestions have been made to develop programs that educate parents and teens on internet safety, as well as appropriate reactions and reporting [35]. However, more investigation is needed to understand the online risks of marginalized teen populations and whether such findings are generalizable to foster youth.

RECOMMENDING FUTURE RESEARCH DIRECTIONS

Alleviating the Tension between Access vs. Exposure

Technology can provide benefits and a sense of “normalcy” to foster youth, as well as an opportunity to receive needed social support [27]. However, due to the lack of solutions ensuring foster youths’ safety while they engage with others through the use of technology, foster parents are forced to take an “all or nothing” approach [3], which either leaves teens exposed to online risks or precluded from having positive online experiences due to lack of access to technology. More research is needed to understand foster youths’ unique online safety needs and explore effective interventions to fill our gaps in knowledge regarding how to best protect foster youth while giving them access to technology. Due to the limited literature on online safety among foster teens, we were not surprised to discover the lack of interventions being developed for keeping foster teens safe while they engage with others through the use of technology.

Some researchers have begun to step away from promoting overly restrictive and control-based approaches to more nurturing ones in offline contexts [38]. Despite these efforts, current intervention strategies have not been successfully implemented [25] for foster parents to receive the proper support to teach their teens effective online strategies, nor to teach foster youth how to protect themselves online. Researchers and designers should prioritize the needs of foster teens to provide avenues for all involved to feel comfortable in giving their foster youth access to technology, while ensuring that teens will use it in

a safe manner. To encourage this action, we provide the following research questions as a helpful guide for future investigations related to foster youth and online safety:

- Who are the stakeholders responsible for developing and implementing policies and interventions that support online safety of foster youth?
- What role should foster agencies, caregivers, and other stakeholders play in mediating technology use within a foster home?
- Does technology use facilitate an increase in foster youths’ offline risk behaviors? If so, how?
- How can we best design, develop, and implement effective interventions for ensuring the online safety of foster youth?

Engaging Foster Youth to Understand Their Needs

To effectively design solutions for promoting online safety for foster teens, we strongly believe that teens themselves need to have a say in the process. Poole and Peyton [42] emphasize the importance of using teens as primary participants in interaction design for adolescents, rather than adults (in our case, foster parents, case workers, etc.) as proxies. In order to do this, we propose using participatory design techniques [2,34]. This process would involve developing partnerships between researchers and foster youth. Participatory design sessions would encourage teens to envision or offer design ideas that may help reach a solution to the problem at hand [14,15]. Directly involving foster youth in the research design process would enable them to openly share their opinions [42]. By listening to their opinions, researchers and designers would then be able to take a user-centered design approach to understand the specific preferences and needs of foster youth when designing interventions, instead of relying on assumptions.

Participatory design with teens has been successful in previous research related to cyberbullying [2]. However, the population recruited in the previous research were teens from a private high school, suggesting a higher socio-economic status than our foster youth population. Other studies have incorporated a family-oriented participatory design process [31], which may also be applicable for foster youth who are in stable in-home situations. Considering the word “family” can have many different meanings, researchers and designers must also include those individuals involved directly in the foster youths’ lives. As the design of online safety interventions affect the entire foster system, it is important to not only involve teens, but individuals who act as their caregivers.

Considering Ethical and Legal Complexities

Even though embarking on research that engages directly with foster youth is recommended, we acknowledge that this research does not come without challenges. We briefly discuss some of these challenges, which include: 1) consent and assent, 2) confidentiality and privacy, and 3) data sensitivity. First, participation of foster teens in research is often governed by federal, state, and local laws and

policies. Some of these regulations require the consent of a biological parent [23] and often depends on where the youth is in the adjudication process. Unfortunately, obtaining this consent can prove to be difficult, if not impossible, since many of these teens are not in contact with their biological parents due to a variety of situations (e.g., parental incarceration) [45]. Because foster youth are often considered wards of the state (regulation 21 CFR 50.3(q)) once they are separated from their biological parents, challenges arise when attempting to conduct research with this population. We propose that future research should look into developing clear regulations for the consent and assent process, as well as practice clearly articulating the benefits of research with foster youth.

Second, foster youth are accustomed to repeating their life stories to multiple individuals (e.g., case managers, guardians, local authorities) and may be too forthcoming with researchers about topics even unrelated to the research. This poses unanticipated consequences as subjects might describe reportable situations (e.g., abuse from a caregiver) without understanding the ramifications of their actions. Although respect for confidentiality and privacy is a major principle of research ethics, a researcher must break confidentiality with a participant to report the incident [56]. Clearly disclosing these mandates to participants in the informed consent documents and the onset of data collection can support transparency and honesty between the researcher and participant.

Finally, working with foster teens may involve collecting extremely sensitive data (e.g., sexually explicit material, drug use, criminal behavior). Handling these data can be difficult, especially if the content violates the teen's rights or puts them in jeopardy. For example, we often try to protect a participant's confidentiality and privacy by removing all personally identifiable information and ensuring any publicly available comments, if retrieved from online platforms, are non-searchable [8]. Unfortunately, with large social media data sets that contain photographs, there is limited flexibility for removing all identifiable information. Therefore, a researcher must make a tradeoff between the risks of exposing a teen's identity and conducting research to benefit this specific population of teens.

CONCLUDING REMARKS

Limitations and Future Research

The purpose of this paper was to urge HCI researchers and interaction designers to focus on a subpopulation of teens that may otherwise fall between the cracks. In doing this, we may have missed some articles that would be relevant to our discussion. Yet, in our literature review, we found very little emphasis on protecting the online safety of foster youth, even after multiple searches. Therefore, we feel it is an accurate portrayal of the existing literature. Due to the lack of literature to inform our work, we drew from other relevant research related to foster youths' offline risk

proclivity and the online challenges faced by other vulnerable teen populations. We did this to draw similarities and make recommendations, but ultimately, our main conclusion is simply that more research needs to be done on protecting the online safety of foster teens so that they can benefit from having access to networked-technology.

In our future work, we plan to conduct more empirical research involving case workers, foster parents, and, most importantly, foster youth to further understand the complex challenges and possible solutions for designing technology-based interventions to give foster youth the opportunity to engage through and with technology without making them even more vulnerable to risks. Our end goal involves allowing foster youth to engage with technology, just like other teens, but also help provide additional protection and guidance to ensure their safety. Future research should focus on introducing technological solutions and educational programs that empower teens in foster care to learn and practice online safety.

CONCLUSION

There are undoubtedly many benefits associated with technology use by foster teens, but these teens are often denied access as an attempt to protect them from high-risk behaviors and outcomes. To help foster youth engage in positive online interactions, we challenge HCI researchers and interaction designers to help us find more effective solutions that allow foster youth to be connected to others online without being harmed. To do this, researchers and designers of more pervasive sociotechnical and interactive systems, such as social media platforms and smartphones, should also consider the unique needs of vulnerable teen populations. While these teens may represent only a small and marginalized segment of all users, they are also ones who can most greatly benefit from being able to safely gain social and emotional support through digital networks. If we can take even the smallest steps to help foster youth gain a sense of "normalcy" in our technology-filled world, we would be making great strides to help those who are most in need.

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