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RESEARCH ARTICLE

Through the Zoom window: how children use virtual technologies to navigate power dynamics in research

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ABSTRACT

Virtual technologies gained popularity during the COVID-19 pandemic for use in research, including research with children. As scholarship from the field of science, technology and society (STS) suggests, technologies are never neutral, but embedded with social values and, as such, used by people to navigate identities and relationships. Building on childhood studies research that has shown how children appropriate and use research tools, this article asks: How do child research participants use this virtual 'window' into their homes and their lives? Using observations from a virtual and in-person study in the United States, we show how children used virtual technologies to manage relationships, filter what researchers saw of their lives, and navigate issues of privacy and self-disclosure. We conclude that analysing children's interactions with research technologies offers important indicators to guide researchers attending to ethical issues of power for both in-person and virtual research with children.

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Introduction

Childhood researchers have likened virtual technologies used in research and teaching to a window into children's experiences and day-to-day lives (Literat, 2021; Strouse et al., 2021). Just like a window, these technologies, which include computing tablets and software such as Zoom, offer access to some aspects of children's experiences and perspectives, their housing contexts, and their home lives. Virtual technologies have gained popularity because of the COVID-19 pandemic, but even prior to the pandemic, a growing body of research on virtual methods laid a foundation for understanding data privacy concerns (Wilkerson et al., 2014), participant engagement (Tates et al., 2009), communication difficulties (Bichard et al., 2022; O'Reilly & Dogra, 2017), participants' ability to discuss sensitive topics (Thunberg & Arnell, 2022), and rapport-building processes (Jenner & Myers, 2019; Shapka et al., 2016). In the context of COVID-19, childhood researchers have built on these insights, identifying and critically evaluating how to co-create data *with* children via virtual platforms and methods based in creative visual practices meant to engage children through ways of their choosing (Lomax et al., 2022; Spray, 2022a). From this perspective of children as agentive co-producers in research (Bradbury-Jones & Taylor, 2015), virtual technologies are not like windows fixed into house walls despite the views they allow. Instead, they are tools, alive and manipulate-able by research participants to mediate the researcher's view – and the data produced.

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Although researchers use Zoom cameras in an attempt to extend the researcher's gaze over physical distance, in the hands of child participants, virtual technologies in fact become another form of participant voice. In other words, researchers know what they know not only because of how the physical contours of a camera lens and computer screen mediate access, but because children use these technologies to manage researchers' understandings of children's lives.

In this article we ask: What are children and young people,[1] as research participants, doing with this virtual window into their homes and their lives? How are they knowingly shaping the virtual interaction, and how is their use of technologies directed by their social positioning and personal agendas within their household context? Though commonly assumed to be objective and value neutral, as with science more broadly, technologies and technological infrastructure are mutually constituted with the socio-cultural and political practices, values, and histories of the people who design, interpret, and use the technologies (Latour, 1987; Winner, 1985). As a long history of scholarship in the interdisciplinary field of science, technology and society (STS) has demonstrated, technologies regularly reproduce prejudicial or inequitable social structures. For example, some New York bridges were purposefully designed to be shorter than originally planned, to prevent the busses that low-income and Black people rode from reaching the affluent Long Island suburbs (Winner, 1985). Negligence in the development of technologies also reproduces inequities, such as designing and testing technologies based on the imagined 'standard' human, typically white, male, able-bodied, middle-class and middle-aged. Technologies, embedded with social values, therefore intersect with social structures to constrain or liberate avenues for socially positioned individuals to operate in the world.

In the present case, we suggest that technologies (and associated governing policies) intersect with generational structures to mediate children's engagements in their day-to-day lives and with researchers. For example, in a Western cultural milieu concerned with child risk and protection, many technologies are now equipped with surveillance technologies that allow parents or schools to monitor children and young people's whereabouts, relationships, or information consumption. Such technologies are embedded with social values privileging child protection or adult control over children's privacy, and they reshape young people's experiences of childhood (Rooney, 2012; Rooney & Taylor, 2016). Conversely, an individual's social positioning shapes how they interact with technology as they parlay infrastructural opportunities toward navigating relationships and contexts (Drusian et al., 2022). Recent STS projects have investigated how individuals use technologies to navigate their age- or generation-based social positioning; in particular, a multi-national project led by anthropologist Miller et al. (2021) investigated how older people have adopted different uses for smartphones (often treating smartphones as a transportable domestic space). Young people, too, use technologies to manage the generationally structured conditions within which they carry out their business. For example Yount-André (2018) has shown how Senegalese children in France used social media to cultivate relationships with family in Senegal and orchestrate material exchanges among kin (see also Hannaford & Beavis, 2018).

Thus, our analytical starting point is that the virtual window is not an 'authentic' view into the lives of young people. No research or technology can provide such a view. Nor do virtual technologies, as interview tools, operate the same for children as they do for any other social group. Rather, the assemblage of technologies comprising virtual research offers new infrastructures for research that are embedded with preexisting social values that affect different social groups in different ways, and that people, including children and young people, will adapt in specific ways to navigate their particular social positioning in the research space, (which can include household, school, etc.). For young people, this social positioning is influenced by age-based research- and household- structures, including ethics board requirements that limit children's right to consent to research and children's interdependent relationships with family members who may or may not decide to be present during children's research encounters (Wiedenman et al., 2023). Children and youth have long been identified as 'vulnerable' to coercion or exploitation in research, and considerations of power are expected components of ethical practice in research with children

(David et al., 2005). Childhood studies scholars have, however, complicated straightforward assumptions of children's vulnerability in research with nuanced analyses of how children use their own, culturally variable forms of power and agency to tactically resist researcher (or parent) questions, protect relationships and loyalties, navigate social tensions, and harness the resources, relationships and spaces of research for their own agendas (Christensen, 2004; Hunleth, 2011, 2017; Spray, 2020, 2022b). Children and youth are also not a homogenous group and the particularities of their power relations – and their navigational strategies – will vary with age, gender, class, and race/ethnicity. Nevertheless, as an effect of their cultural representation and structural constraints, children almost always occupy and negotiate different social positions to the adults in (or out of) the room (Wiedenman et al., 2023), and those structural and relational positionalities and power dynamics also shape knowledge production (Christensen, 2004; David et al., 2005).

As part of navigating their social worlds, children make choices about how they represent themselves, disclose their views or experiences, and respond (or stay silent). Here, we argue that research technologies offer new ways for children to make those choices. As researchers have pointed out, children *do things* with the tools and technologies of research (Hunleth, 2011). Children can re-appropriate the tools of research, as Hunleth (2017) illustrates in her work with Zambian children who took her digital recorder away from the research space to record their own stories and conversations. Hunleth's observations, along with those of other child-centered researchers working with technology-based research methods such as photovoice or video (e.g. Lomax et al., 2011), point to the importance of examining children's agency and social agendas in the methodological discussions of virtual research with children. Understanding how children engage with research technologies, then, is critical for evaluating how the research context is shaping the data produced.

To date, however, researchers primarily have focused on children's technical competencies and engagement with the researcher, leaving out how children use virtual technologies to meet their needs and desires in the research encounter. As we will show in this article, analysing young people's interactions with interview technologies offers insight into the power structures and relationships they navigate in their households and with researchers, including those that researchers may be overlooking in in-person interviewing. Our intention here is not to advocate for one method over another; methodological choices are always contingent on factors such as local social context, research aims, and researcher and participant positionalities. Rather, our goal is to articulate an analytical perspective for considering how technologies can reconfigure knowledge coproduction in research with children, to resource researchers with a way of thinking through technological options in their own methodological design processes.

Research with children in households and online

We base this article on observations from a study we designed to understand children and young people's experiences of asthma management. Our study took place in two U.S. cities – St. Louis, Missouri and Gainesville, Florida. In total, 13 families and 24 children and young people ranging from age 4–16 years (16 children with asthma and 8 siblings) participated in home-based and/or virtual interviews. See Table 1 for more details on the sociodemographics of the children and their households. Most participating children lived in households with low-incomes and in areas of St. Louis and Gainesville known to have higher asthma rates, likely related to social, economic, and environmental injustices (Harris, 2019). Most children were recruited because a parent/guardian had previously participated in a qualitative interview on asthma caregiving. The household and child-centered study was developed to examine children and young people's experiences of managing asthma in the context of their everyday home life (see Spray & Hunleth, 2023).

Our original in-person protocol included two in-person household visits with the children of caregivers who had participated in our prior research on asthma. We initiated this research in January 2020. During these visits, we carried out participant observation, interviews, and a

Table 1. Participant Characteristics and Interview Methods.

Child Participants (N = 24)	N
Age	
<6	3
6–9	6
10–12	7
13–15	8
Gender	
M	14
F	10
Racial background*	
Black/African American	17
White	7
Asian	4
Interview Method	
Initial in-person interview only	4 (4 St. Louis)
Initial in-person visit and online follow-up	5 (1 St. Louis; 4 Gainesville)
Initial and follow-up online	3 (3 Gainesville)

*Some participants identified with more than one category.

survey on asthma severity and management. Alongside these, we offered a menu of arts-based and participatory activities children could choose from. Such activities included show and tell, mind mapping, conversational interviews, crafts, and drawing, with the goal of children and researchers co-constructing an understanding of children's asthma experiences (see Spray & Hunleth, 2023).

On March 8th, 2020, after having visited 9 households at least once, we paused the research due to COVID-19. We resumed household research online via Zoom 6 months later, with the children on devices, such as tablets, smartphones, and laptop computers and one researcher connecting with them on their home or office computers.[2] We gave families the option of using their own device. However, because the participants were largely low-income and had limited digital connection, we also offered to deliver a tablet along with a portable hotspot device to families via contactless drop-off. Most families requested the research equipment, and we dropped off tablets to 8 households.[3] We continued to use our arts-based and participatory approach with one interviewer carrying out activities but adapted for Zoom. For example, we used the whiteboard function on Zoom to continue drawing with children virtually. We also created new activities for our online research like creating a template that represented an 'introduction' to asthma that children could fill out through drawing or text. We aimed to retain the 'feel' of household research by delivering children supplies of snacks and art materials that children could use for any sensory activity they wanted during the interview. For a visual depiction of this process, see Spray et al. (2022).

We could not, however, retain some aspects of the in-person household visits. For example, during the in-person visits we were typically greeted at a door, invited into living spaces, and we met multiple household members. It was chaotic, but a happy chaos filled with excitement and chatting. Being physically present had helped us understand the material and relational environments in which children managed their asthma. In contrast, our only in-person experience of children's homes and neighborhoods for the Zoom interviews occurred with a quick handover of the goody bag, including tablet, at the front door. When the tablet's camera came on, we typically only saw the child alone, their face looming large in the Zoom frame. Caregivers and other family members were sometimes present in the room, but we mostly knew they were there when we heard their voices or saw the child glance toward them. We had partial glimpses of ceilings, carpets, walls and doors, but little of the rich sensory experiences that contextualized our participant's narratives in our three-dimensional encounters. See artist renderings of these glimpses in Figure 1.

As the research progressed online, however, we started to identify the dynamics the technology created and the unexpected (to us) ways that the children were using the technology. Below, we identify three ways that the children used the virtual platform: to manage the other relationships and people in their house or room; to reveal what we (the researchers) could see of their homes, and

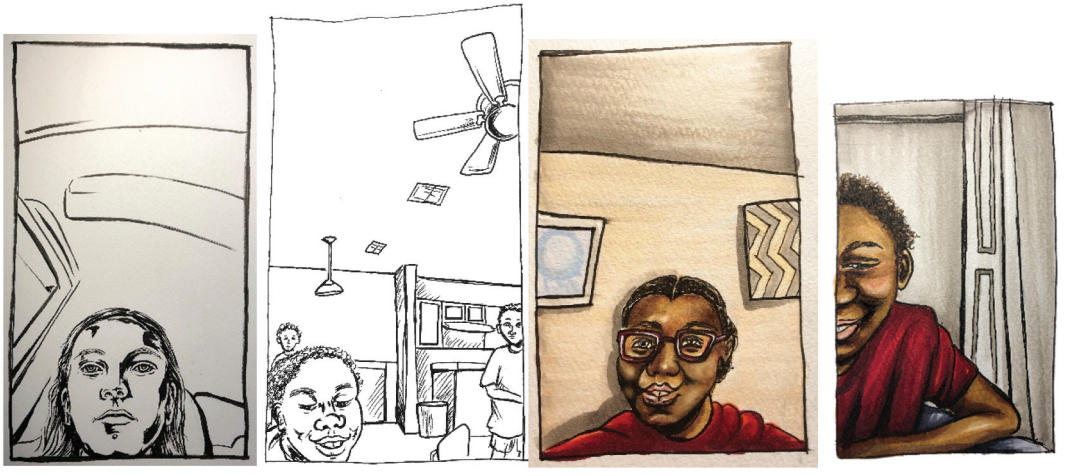

Figure 1. Four renderings of partial glimpses into children's homes through Zoom. From left, upward angle of Esther's face while in a car, participant's head and shoulders in their living room with siblings looking on in the background, 16-year-old Marie's head and shoulders with artwork hanging on the wall behind her, half of Shadow's head and shoulders with an open closet in the background. Drawings by Julie Spray.

to manage their self-presentation and gain a view into researchers' lives not typically available in in-person research.

Children used technologies to manage the other relationships in the room

During both the in-person visits and online interviews, children often did not speak to us from a private space. Many lived in housing where they shared a bedroom and had little space that they could call their own. The in-person interviews typically took place in living rooms or at dining room tables, central areas of the home where many people aside from the children in the study circulated throughout our visit. Similar to other researchers (e.g. Cheney, 2011; Hunleth, 2011) we found ourselves attuned to and also managing the expectations of multiple people, and strategizing how to limit caregiver involvement during the interviews and activities that were intended for the children.

When we moved to virtual interviews, we noticed how children used the technology to re-position the interview and the researchers' attention on them and only strategically involve caregivers when they wanted their input. Young people brought the study tablet to more private spaces inside and, in one case, outside of the house where they could have some quiet and privacy. But privacy was often fleeting, and many carried out interviews in the presence of others who were in or walking through the room, though the virtual platform meant that these others and the researchers often could not see each other. Where others in the room during an in-person visit could take over the discussion, excluding the child, the virtual platform enabled children to manage their interactions. Although participants always mediate any form of research observation to some degree, the way children deployed the tablet's infrastructure as a mobile audio-visual device demonstrates their more limited power to direct the research encounter during in-person visits.

The technology offered tools to children whose caregivers were highly involved in interviews, such as 10-year-old Lion (all names are pseudonyms of children's own choosing). When we first met Lion and his mother, Pamela, in an in-person visit, Pamela dominated the conversation until one researcher engaged her in a one-on-one conversation so the other, Hannah, could hear from Lion. A similar dynamic unfolded during the second virtual interview, as Pamela stayed near Lion throughout our conversation, though never appearing on camera. She often responded to Hannah's questions to Lion:

Hannah: What's different about your life now [since we last spoke]?
Lion: Well, I went through a city bus accident.
Hannah: Uh-oh. When was that?
Pamela: You got treated. September—
Lion: September—
Pamela: - of last year—
Lion: - of last year.
Pamela: - and completed February.
Lion: I completed physical therapy in February.
Pamela: This year.
Lion: Of this year

Pamela continued to answer Hannah's questions and tell lengthy stories, as she had during the in-person interview. Unlike the in-person interview, Lion now had Hannah's gaze. He kept the camera trained on his face and directed wide-eyed looks into the camera, signaling that he knew his mom was talking too much. Lion and Hannah also held their own silent conversation during Pamela's stories. As one example, Lion would mold the Play-Doh we had included in his packet, holding it up to the camera, and therefore in front of Hannah's face, in a way that would have been inappropriate during an in-person interview. Taking his direction, Hannah wrote on the whiteboard that his Play-Doh creation looked like a snail, to which Lion nodded silently.

Similarly, another child, Rick (age 13), in St. Louis, would direct the camera to his action figures and dogs while his mother talked, taking advantage of the camera to continue expressing visually when he lost power over the audio. Marie (age 16), from Gainesville, selectively muted the microphone so that we could not hear words spoken by someone off-camera in her house. We do not know why Marie used mute, but we can envision mute as an option that another participant, 13-year-old Courtney, would have desired during our in-person visit when adults in her house started a tense conversation in the kitchen. We had been seated at the kitchen table, drawing, when the adults started arguing. They moved their conversation to another room, but their yelling was still loud enough for us to hear details of their argument.

In the virtual interview space, children constructed their own boundaries, patterns of communication, and styles of interpersonal engagement. They did so in ways that did not explicitly challenge adult authority or breach social norms of talk between children and adults. These constructions were possible because the tools that the new technologies introduced into the interview – a camera, a white board for writing, a mute button – allowed children to construct their own boundaries, patterns of communication, and styles of interpersonal engagement. Such stark examples illustrate the subtle ways in which children may do similar managing of boundaries and communication during in-person visits and when such management is impossible. One example from our previous research was when children drew alongside adult conversations, findings ways to interject their wishes through their drawings, and after the adult talk had finished (Hunleth, 2019).

Children used technologies to frame what researchers saw of their life circumstances

During our in-person visits, we met children in places in the house identified by their parents or guardians. These were typically communal spaces, and while children may have had some say or expected to meet visitors in such places, it was difficult to know how much they approved of carrying out the research in those locations. Further, once in place, the children could not manage our gaze – our eyes were our own to move. We saw artwork on walls, family pictures, books, moving boxes, and furniture in these spaces that all shaped our understanding of the children's lives. While we were able to observe much in these spaces, there was much we could not see. For example, we did not usually enter more private spaces like bedrooms. As we started the virtual interviews, we noticed

that the children were using the technology to frame what researchers saw of their life circumstances. The tablet's camera became our eyes, in the child's hands.

Children used the Zoom window to show us only what they wanted us to see of themselves and the spaces they were in. During our first in-person interview with Rick in St. Louis, his mother Rebecca had welcomed us into the living room, directed us to seats, and offered drinks. During our virtual visit, however, Rick became the host, showing Sienna his action figures, his dog, and parts of his bedroom to see and talk about. By positioning the device, children could control what we saw. They could avoid or conceal spaces of the home that they found uninteresting or that were busy or embarrassing. As in Rick's example, they could also reveal more private spaces and interactions with family members.

Esther, a 15-year-old girl from Gainesville, offers an example of this spatial selectivity. During her first Zoom interview, she sat in a parked car in the driveway of her home, something she and her caregivers might not have seen as socially appropriate during an in-person interview. During the second, she sat on an outdoor brick patio in the front of their home, a double-wide trailer. In effect, the interviewer (Hannah) never entered the house. When talking about how her life had been between her first and second interview, Esther said she 'had a little bit of stressful times' because of conflicts between friends and family members. She lived with her parents, four siblings, a sibling's partner and two children, and several pets, and she spoke to us about how household conflicts could trigger her asthma. Esther managed her asthma in these instances by "seclude[ing] myself away from everybody so I don't have to worry so much about them always tryin' to bother me about something." Similar to how she dealt with her asthma while at home, she used the flexibility of the online interview to choose different spaces for the interview that were less chaotic, more peaceful, and away from others. The privacy Esther created allowed her to delve into personal details, stories, and feelings that she likely would not have wanted to divulge with family present. When asked to make a storymap of her asthma experience that labelled household locations where her asthma was exacerbated or where she treated her asthma, she included her mother and sister fighting in the living room, alongside a drawing of her coughing in bed and drawing at the dining table in an attempt to separate herself from others and relax.

Becca, a 10 year old from Gainesville, used the technology in a way that showed more of her living space than we would have seen in an in-person visit. During her first Zoom interview with Hannah, she brought the tablet into the bed next to her sleeping mother to wake her and ask her questions about her asthma medications and symptoms. Becca tilted the tablet so that the camera pointed directly in her mother's face. Becca then insisted that Hannah ask her mother the questions. While Hannah was taken aback at the intimacy of the encounter, Becca's mother did not seem discomforted. Hannah asked the questions that Becca had not wanted to answer, and Becca's mother answered each question quickly with her eyes lightly closed. After she finished answering the questions, she handed the tablet back to Becca who brought it into her own room. The camera swung with each of her steps and Hannah could intermittently see Becca's face and the ceiling before the view eventually settled on her forehead as she laid down in her bed. Becca ended the interview from her pillow. Like Becca, Courtney (age 13), Shadow (age 10), and Rick also chose to carry out virtual interviews in bedrooms, more private locations that we otherwise would not have seen in in-person interviews that revealed more information about how children constructed and navigated spaces in their homes.

Researchers have noted the importance of concepts of home to children, especially due to children's limited mobilities and access to public space (Halldén, 2003). For children, home can relate symbolically to family and intimacy and also be a site where both time and space is regulated (Douglas, 1991; Halldén, 2003). Using virtual technologies, children controlled what aesthetics of the home were seen or unseen, appropriate or inappropriate. Through the Zoom window, children removed emotional tension and family conflict from their views of the home and introduced scenes of great intimacy between members of the household. In their virtual spaces, children navigated the borders between private rooms, between indoors and outdoors, as well as the emotional boundaries between people to create a virtual view of the home that met their affective needs during the

interview. As such, we were afforded views of how children wanted us – the researchers – to see their home, views that are difficult to obtain in traditional in-person visits (but see Lomax et al., 2011 for how children demonstrated similar curatorial practices when creating videos about their disadvantaged community and Hunleth, 2011 for how children demonstrated these through drawings of home).

Children used technologies to navigate seeing and being seen by the researcher

Children are often positioned as the objects of adult enquiries and gaze, expected to answer adults' questions, but admonished for staring at adults or asking personal questions (such staring and questioning would be considered rude for adults to do to one another also). Such social norms of conversations emerge also in interview encounters, especially when researchers come into children's homes, schools, and other spaces. In contrast, researchers often bring less of their own worlds into the research space, though we do bring bodies, clothes, accents, and other things that can become objects of curiosity for the children. This balance of researcher-participant self-disclosure, however, can shift with virtual interviews as children are able to both see and control more of what they reveal to researchers and, likewise, learn new things about the researchers' lives through what they see on camera.

Zoom's self-view feature allowed children to see themselves the way we saw them and then change the way they appeared to us. This often included how much of their face was visible on camera. Twelve-year-old James, for example, showed most of his face during his first Zoom interview. But then in the second Zoom interview, he kept the tablet tilted so that Hannah (his interviewer) could only see the top of his hair, the couch, and yellow wall behind him. Knowing this wasn't a technology issue, Hannah asked him to move the tablet so he was visible on camera. James moved the tablet, but then minutes later returned it to where only some of his face could be seen. This happened again, making Hannah realize that James likely wished to stay off camera. Rewatching the interview, we identified how James's responses differed when on and off camera. With only his forehead on camera, he opened up about topics that were difficult to discuss on camera, such as times when his asthma treatment hadn't worked, and his mother took him to the hospital. Similarly, we hardly ever saw Shadow's face on screen. But throughout the interview he was actively engaged and conversational, explaining how the smoking in his house affected his asthma, something we realize was difficult for him to speak aloud because of how it implicated his caregivers. Sometimes not seeing or being seen enabled children to speak about what was most important, something not as easily controlled by children during in-person research without spatial or physical separation, such as in Hunleth's (2011) research with children who hid in different rooms to talk on a recorder.

At the same time, we as researchers felt more exposed in virtual interviews than during the household visits. When we visited households, the only information about us that children could access was what we brought with us, and what we wore. By Zooming from our rooms and personal offices, we effectively invited children into our households as well. Some children responded by initiating rapport and engaging with us and our lives in ways they were not able to in person. Many children did this by asking questions about our homes and meeting our pets. Hannah's cat (a ragdoll named Boris) frequently appeared in interviews and was a central part of how several children connected with Hannah. In the online follow-up interview with Shadow, Hannah had to pause to let Boris leave the room. When Shadow saw Boris in the background, he said:

Shadow: 'I've never seen a cat so big before!'
Hannah: 'Oh, really? Yeah, he's a big boy. Say hi. Say hi, Boris.'
Shadow: 'I also have a dog.'
Hannah: "Oh, you do? [Shadow points tablet towards dog] Awe. Hi, puppy! Wow, so you've got a turtle and a dog.
Shadow: 'Yep. They both stay in my room.'
Hannah: 'Do you have your own room?'

Shadow: 'Yes. I'm in my room right now.'
Hannah: 'Oh, very nice. I'm in my room too. I got my bed over there with another cat on it.'
Shadow: 'You have another cat?'
Hannah: 'I do. [Hannah points laptop webcam towards bed] This one is just sleeping. How's your asthma been recently?'

The small, non-asthma related exchange at the beginning and others that occurred during the interview shaped Shadow's relationship with Hannah during the interview to the point he didn't want to log off, asking to do another activity when Hannah began to close the interview. Hannah also introduced her cats to Courtney, who excitedly disappeared off screen to get her kitten, Strawberry. The two then waved paws at each other through the Zoom window. Courtney was able to introduce Hannah to her dog Zoe who was shy of strangers in person but spent the entire online follow-up interview cuddled next to her.

Noticing the success of Boris' presence, Hannah began keeping the cat in her room before Zoom interviews hoping for a chance to introduce him. Julie also tactically oriented her office space before Zoom interviews, hanging within view of her webcam the drawings that interviewees had made for her during their initial household visits. As researchers, we adapted and responded to being seen by children and altered our spaces in order to communicate, connect, or conceal. Hannah recalls a perpetual stack of papers she would stash out of view before logging on. Due to the software's 'gallery' feature, we saw ourselves the way children saw us through the Zoom window and were conscious of the changes we made to our expressions, our backgrounds, and how we angled our laptops for the lighting. The Zoom window allowed us to share with the children we interviewed who used what they learned about our lives to engage with us.

Children used the two-way quality of the Zoom window that extended into researchers' homes to connect with us based on what they could see of our backgrounds and settings. Rather than visiting children in their homes and focusing entirely on their environment, the Zoom window gave views into our lives as well, creating a space of shared vulnerability between researchers and participants and giving children the opportunity to engage with us as more than strangers visiting their homes. As children asked about our pets and observed our homes and offices, they connected with us on aspects of our lives that we would not typically bring into the research setting. We have identified in our in-person work that children wish to know more about our lives. For example, the children in Hunleth's research drew what they perceived her house and life outside of fieldwork to look like in the hopes that she might fill in details to fuel their imaginations (Hunleth, 2011). Other scholars have noted that in the virtual classroom or in online research with adults, video chat enables school and fieldwork to extend into daily lives of teachers and researchers (Howlett, 2022; Williamson et al., 2020). As such, online methods can facilitate more symmetrical relationships between researchers and participants to the extent that participants can control researchers' view of the field and see into the private lives of researchers (Howlett, 2022). Like scholars who found that online research helped even the playing field between researchers and adult participants, we argue that the unique features of online research gave children more power through their ability to manipulate the camera to shape our view of them and to see into our lives and ask questions based on what our cameras revealed. Other researchers have noted that other features of online research with children like options for digital activities and asynchronous chat features help children participate in research on their terms, choosing exactly what they want to do throughout the project (Lomax et al., 2022). We add that the rapport between ourselves and children grew out of the shared opportunity to introduce each other to our home spaces and day to day lives. As Spray (2022b) has shown, there are many ways in which a loving connection is cultivated and expressed through in-person methods, but the intimacy of mutually sharing and seeing each-other's lives is not typically available using in-person research methods.

Concluding discussion

Children's and young people's use of the camera, frame, and virtual space of video chat research constitutes unique ways for children to engage in the research process. Although virtual research replaced many in-person research projects by necessity in the pandemic, it is not a simple stand-in for the activities that took place during such projects. In fact, virtual research introduces new rules and approaches from researchers due to lack of established norms to guide the use of methods, for example how to conduct formal interviews in informal participant settings, how to navigate participants' privacy, or how to assess a participant's unseen body language, among other issues (Thunberg & Arnell, 2022). We aim to inform approaches to online research by increasing our understanding of how children approach virtual technologies. We saw children taking control of the Zoom window to mediate a different view of their lives from what we would have accessed in-person. Children took us with them as they climbed in bed next to their mother or shielded us away from seeing their own face and body. They concealed caregivers while covertly maintaining communication with researchers. They looked through the Zoom window to see into the backgrounds of researchers, connecting on our spaces that were now apparent in video chat.

Analyzing how children used the research technologies illuminated dynamics we missed about our prior, in-person visits. Children showed us how they might have wanted to manage the in-person visits differently had they the power or tools to do so. By recognising how children mediated our view of their homes, we also retrospectively recognise what children may have wanted us to see or not see about the environments we physically entered, environments that our unmediated gaze was free to observe. By observing how children positioned themselves in front of the camera, we learned how children might have wanted us, in person, to see and not see different things about their faces and bodies. And by recognizing how children engaged with their window into our worlds, we recognize that children may have wanted to see more of us and our lives when we walked into their homes.

Virtual interviews, by differently enabling children's agency, highlighted how much about in-person interviews children could not control. Such insights resonate with similar reports from childhood researchers using other technologies, for example, Lomax et al. (2011) recognized that children involved in participatory video research would use the video camera to manage the audience's gaze and view of their impoverished housing estate. Others have found that virtual technologies could also engage children in more playful interactions with researchers in which researchers and children transformed the meanings of data (Ruiz et al., 2022). Researchers have long considered what technologies such as audio recorders or cameras change about research relationships, participant performativity, and the nature of the data produced. We add to this by suggesting that technologies and their material infrastructure, in opening up or constraining our interactions in new ways, can reveal overlooked dynamics of un-technologically-mediated interactions (i.e. the non-virtual, in-person encounter). Virtual interviewing technologies showed us how children made different choices about how they wanted researchers to see their homes, their families, and themselves when offered a choice.

What, then, does this knowledge mean for researchers returning to the field, re-entering children's homes, and seeing freely? Perhaps children's use of virtual technologies in our study suggests that many adult researchers, including ourselves, may underestimate the effects of adult-child power imbalances in in-person research, or overlook the subtle tactics children employ to manage their self-presentation. We do not, however, interpret this finding as suggesting that researchers should not use in-person research with children. Rather, we suggest that watching *what children do* with the tools, resources, opportunities and constraints of research spaces can tell us about how they experience and navigate their social position – and provide important indicators for researchers as they attend to relational, ethical and epistemological issues of power, agency, and voice throughout the research encounter (Meloni et al., 2015).

By drawing on STS theory to recast research technologies as socially produced and embedded, we offer an analytical perspective through which future researchers may

consider their own methodological choices. STS scholars have already demonstrated the way different groups of people differently exploit the infrastructural opportunities of technologies such as smartphones according to their situated social positioning (Drusian et al., 2022; Miller et al., 2021; Walton, 2021). Similarly, research technologies, whether they be drawing pencils (Spray, 2021), recorders (Hunleth, 2011), video recorders Lomax et al. (2011) or tablets with Zoom software, have different social implications for the different children (and adults) who engage with them as participants and researchers across different contexts. We analysed how children, mostly at a particular intersection of class and race in U.S. society, used virtual technologies to differently navigate their generational position. We leave the question open as to how different technologies may have different implications for other social groups and identities, and how these implications may differently matter for knowledge-making processes. For this group of children, who had less access to power and privacy and less ability to manage what is revealed to researchers in an in-person setting, the virtual technologies we used as an accident of the COVID-19 pandemic ultimately shifted power dynamics in ways that, for the most part, appeared to suit the preferences of the child participants. Such techniques might, in some cases, be more ethical than in-person research methods, particularly if participants can choose between in-person and virtual options (e.g. as Spray, 2022a did). As well as infection risks, virtual technologies could also circumnavigate geographic distance or other barriers to research participation, though distance may foreclose the possibility of delivering technologies to technologically disadvantaged participants. As with any methodological option, researchers would need to weigh potential advantages of virtual technologies with the limitations. We simply encourage researchers to consider technologies not as value-neutral tools for solving practical problems, but as social tools that are differently used by, and have variable implications for, differently socially positioned participants.

Notes

1. In this article, we use the terms 'children' and 'children and young people,' which are variably defined in the literature. We view childhood as a generational position and relationship and define the child as a context-specific social category typically demarcated through laws and policies that restrict children's rights and agency and formalise generational relationships (e.g. consent and assent to research). In the United States, where this research took place, a child is anyone under the age of 18 years old. We use the term 'children and young people' to acknowledge the age range in our study and that some of the older participants may not see themselves in the category of the child.
2. Interacting with participants across a series of interviews could also have helped develop greater rapport between the children and the researchers and allow participants to feel more comfortable sharing their experiences with the research team, which could have informed our observations of the children's disclosures while on Zoom.
3. Because many of the participants used the tablet provided, they may have experienced greater mobility with research technology than if they had joined their Zoom interview on stationary devices like desktop computers. This enhanced mobility may have enabled children to be more selective in what they showed researchers of their lives because they could move the tablet to different rooms or outside of their home.

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