



## Opinion paper

## Child-Computer Interaction in times of a pandemic

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## 1. Introduction

The increasing presence of interactive technologies in children's lives poses critical ethical questions for researchers and designers. Discourse specific to these intersecting topics is nascent, spread across communities and largely developed retrospectively. In a series of workshops and panels at the annual ACM Interaction Design for Children (ACM IDC) conference, a small group from the community has aimed to provide a central space and continuity for this discourse. The most recent of these spaces was the ACM IDC 2020 workshop entitled, "Emergent, Situated and Prospective Ethics for Child-Computer Interaction Research" that brought together a small group of researchers interested in sharing and discussing ethical issues arising when researching, designing, and deploying technologies for children [1].

When we, as the two main organizers of the workshop, wrote the workshop proposal we were particularly interested in how the ethical challenges in Child-Computer Interaction (CCI) were changing in the face of a rapidly changing world. At that time, it was completely unknown to us how different the world would be when we conducted the workshop. When the participants eventually met online for this workshop in late June 2020, a global pandemic had changed public life as we knew it and social justice issues, as manifested in the Black Lives Matter movement, were causing widespread unrest. Layered on these immediate challenges was the looming climate crisis that poses one of the most existential threats to humans yet.

When we ran the workshop, we decided to focus our discussions on sharing thoughts and experiences of what these monumental shifts might mean for our community. The question, which we put onto the virtual floor was: *How is the ethics of your research changing in the face of the Covid-19 Pandemic and recent social justice issues, as manifested in the Black Live Matters movement?*

What followed was a rich and thoughtful discussion. Every participant was affected by the pandemic in different ways, both personally and professionally. In the 45 min session we had reserved for this part of the workshop, we were all not only connected via video link, but also collaboratively worked on a shared virtual whiteboard at the same time. In a very productive mix of show and tell, we collected sticky notes, online resources, quotes and other bits of information; all the while making connections and categorizations. Later, we, as the two main organizers, discussed our observations from the workshop, and then reviewed the data and our own notes to informally look for themes related to our original question. We wrote up the themes individually, and worked collaboratively to refine, clarify, and contextualize them. From this exercise, four main themes emerged, which all included perceived challenges as well as the participants' recommendations for how these concerns might be addressed moving forward. The following briefly summarizes these themes.

## 2. Emerging perspectives on Child-Computer Interaction in times of a pandemic

## 2.1. New and old digital divides made visible

While the CCI community has always been aware of social justice issues around access to interactive technologies, particularly in the developing world (e.g. [2]), the pandemic and resulting physical and social isolation has foregrounded new digital divides that have been largely invisible to many of us working in the developed world. For example, one researcher shared that they had observed widely varying experiences around the impact of physical and social isolation on families. In some cases where children were sequestered at home with parents who worried for their livelihoods, households were under a tremendous amount of stress [3]. In these cases, there were severe limits on the amount of time that parents could spend with their children, struggling to meet the additional demands of scaffolding their children's educational objectives, both online and offline. This highlights the realization that dedicated time in which parents and children can

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work together in quiet spaces are luxuries for many regardless of social class or geographical location.

The recognition that technologies for children always re-structure power imbalances, creating new exclusions and divides in the midst of all of our societies, prompted us to think of how we could foster awareness and critical reflection on these issues within the CCI community. There were suggestions, for example, for improving accountability to social justice issues in our work by developing the required section on participant selection in the ACM IDC paper submissions template to specifically include a discussion of how the research addressed issues around the digital divide and how it may restructure these divides. There was also a suggestion around adding another required section to this template in which authors envision how the results and/or future products created through their research would or would not address social justice issues. Other solutions that specifically addressed the changing needs of children during the pandemic included researching and developing new forms of remote communication for children, **for example, those that enable children to navigate new ways to form social supports when they cannot be face to face, and ensuring that these tools are accessible across the digital divide. For example, the first author has just received Covid-19 specific funding to work with an industry partner to develop a child-focused version of their private social network platform<sup>1</sup> that supports children to make safe connections and access health literacy programs and resources targeted at children.**

## 2.2. Digital literacy

Other participants noted that prior to the pandemic researchers recruiting for studies often experienced a feeling of reluctance from parents, caregivers and/or teachers to let children participate in interactive technology and/or digital media usage. They encountered a general and mostly undifferentiated suspicion that additional exposure to digital technology would result in “too much”. The same researchers mentioned that they now experience a shift in that parents, caregivers and teachers have appeared to have swung 180 degrees and now find it desirable to have children participate in studies that would help them to come up to speed in different areas of digital literacy. This shift may present an opportunity for the CCI community to contribute beyond academia to engage with ongoing societal debates with more nuanced views on the purpose and nature of different interactions with digital technology.

The push in digitalization in areas such as education or communication during the pandemic seems to have changed many parents’ perception of the digital as something that goes beyond their children’s entertainment. As researchers and designers, we have to think more about how to respond to this renewed need to better equip children and their guardians with competencies that reflect the broad range of aspects of our lives that digital technologies now have roles in. This may not only mean highlighting digital literacy targets during recruitment for studies, but also more dedicated research into how to scaffold the learning of both parents and children to actively participate in a digital world.

## 2.3. The quality of screen time

The pandemic also laid bare how much of the discourse around screen time was reductively focused on “how much” as opposed to “what” and “why”. Discussions in both academia and within families around how much screen time was healthy

for children across various age groups have been dominated by issues of quantity of media usage, with special attention when introducing technology to younger infants or toddlers, as well as practical techniques for healthy and sensible strategies for how to best manage screen time [4]. Several researchers noted that as a result of the pandemic the different qualities of time online have become very much more visible as digital tools have become vital for families and children to connect to teachers and/or friends. Again, workshop participants felt that they had a responsibility to take a role in these broader societal discussions in terms of painting a more nuanced picture of children’s experiences with digital technologies that help parents and teachers make better judgments in creating appropriate digital environments for their children. Within academia there is an opportunity to nudge research agendas and debate away from a focus on quantity and management towards a more holistic understanding of what constitutes quality screen time in the context of different elements of childhood and digital literacy.

## 2.4. Participation in times of a pandemic

Lastly, several researchers reported on their efforts to re-think their participatory design approaches in times of social isolation using innovative distributed and online methods. Pivoting a face-to-face workshop with children requires “PD in a box” methods, in some ways similar to Cultural Probes [5]. For example, being able to package up design materials and resources and deliver them to children’s homes was required so that children could participate in hands-on design or maker workshops at home. These sessions must be facilitated with asynchronous and synchronous supports and several researchers acknowledged that little was known about how to facilitate these sessions remotely. This presents another fruitful area for research and exploration, and several of the workshop organizers had already actively begun this work. There was also a discussion about not only the qualities of participation that were lost in these remote sessions, but also what might be gained, such as including siblings in the workshop or being connected to the whole household.

One of the possible benefits of this shift towards remote participation is the prospect that sessions with children could now be more inclusive due to the fact that children who do not have access to research labs and university campuses could now be involved. But again, households that are hardest to reach, without internet connection or parental support, for example, may be excluded — yet again raising issues around social justice and equal access. Another possible benefit may be the change of group dynamics in online workshops. One participant shared the experience that in one of their online sessions, one of the children started using the private chat function with the facilitator, which gave the child a channel to express itself in ways that may not be possible in a physical setting that may be associated with more social peer pressure. This opens up the space of exploring how to support novel interaction approaches during participatory design workshops with children, extending our repertoire of tools.

On the other hand, much is lost by moving design and maker activities online, particularly the shared, hands-on, social experience of designing and sharing together. Researchers also reported that it was much harder to get a “feeling for the room” virtually and that they had not yet found a substitute for the physical experience of quite literally bringing ideas from a corner to the center of the collaboration.

These anecdotes point to the need for thorough research into the opportunities and failures of communication technologies in these unique times. There was broad consensus that we do not know nearly enough about how to structure, scaffold and facilitate participatory design over distances. Thinking forward,

<sup>1</sup> Stronger Together created by [Curatio.me](https://www.curatio.me/).

we may also benefit from these insights when designing novel technologies that may enrich offline interactions or when developing hybrid participation formats that bring together the best of both worlds.

### 3. Outlook

While Covid-19 itself will hopefully be tamed by a vaccine, the impacts on our society are permanent. The pandemic has served as a magnifying glass that has laid bare new and old divides, structural inequalities and revealed broken promises and destructive mechanisms of our digital society. The knee-jerking switch to remote education has presented us with a sobering reality check for the levels of impact and equity of our work. But it has also revealed new opportunity spaces and a sharpened sense of where research needs to fill gaps.

We hope that the pandemic will prompt the CCI community to intensify its efforts to research meaningful, real world roles of technology in children's lives and address issues of children's participation in its design. Perhaps mounting social unrest presents us with an opportunity to critically reflect and expand our perspectives on the dimensions of social justice in our work. It is a good time to ask, *Whose futures are we designing for and who is left out? Whose agendas and ideas are we able to consider when configuring participation in our research and practice? And, How are our technologies re-configuring power and creating new mechanisms of exclusion or inclusion?* We think that these questions need to shape our work beyond immediate responses to Covid-19 and social unrest, becoming central concerns that may enable us to also meet yet more serious challenges, such as the climate crisis, and the imperative to build more inclusive, fair and just societies. In "building back better", our research community has a role to play. As you are able, we urge you to engage, discuss and work as a community to address these issues.

### 4. Selection and participation

There were no participants involved.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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### References

- [1] Alissa N. Antle, Chris Frauenberger, Monica Landoni, Jerry Alan Fails, Marina Jirotko, Workshop: Emergent, Situated and Prospective Ethics for Child-Computer Interaction Research, in: Proceedings of Conference on Interaction Design for Children Extended Abstracts (IDC '20), ACM Press, 2020, pp. 54–61, <https://dl-acm-org.proxy.lib.sfu.ca/doi/10.1145/3397617.3398058>.
- [2] Kawa Saba, Ye Yuan, Akeilah DeWitt, Qiao Jin, Susanne Kirchner, Abigail Bilger, Ethan Grantham, Julie A. Kientz, Andrea Tartaro, Svetlana Yarosh, Another decade of IDC research: examining and reflecting on values and ethics, in: In Proceedings of the Interaction Design and Children Conference (IDC '20), ACM Press, 2020, pp. 205–215, <https://doi-org.proxy.lib.sfu.ca/10.1145/3392063.3394436>.
- [3] L. Fontanesi, D. Marchetti, C. Mazza, S. Di Giandomenico, P. Roma, M.C. Verrocchio, The effect of the COVID-19 lockdown on parents: A call to adopt urgent measures, Psychol. Trauma: Theory. Res. Prac. Policy, vol. 12 (S1), S79, (20200611), <https://doi.org/10.1037/tra0000672>.
- [4] R. Viner, M. Davie, A. Firth, The Health Impacts of Screen Time—a Guide for Clinicians and Parents, Royal College of Paediatrics and Child Health, 2019, [https://www.rcpch.ac.uk/sites/default/files/2018-12/rcpch\\_screen\\_time\\_guide\\_-\\_final.pdf](https://www.rcpch.ac.uk/sites/default/files/2018-12/rcpch_screen_time_guide_-_final.pdf).
- [5] B. Gaver, T. Dunne, E. Pacenti, Design: Cultural probes, Interactions 6 (1) (1999) 21–29, <http://dx.doi.org/10.1145/291224.291235>.