Risks, Opportunities, and Ethical Considerations for XR Use by Neurodivergent Youth

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ABSTRACT

Our team would like to participate in the workshop, "Extended Reality and Children: Risks, Opportunities, and Ethics," to not only discuss recent research projects, but also to pose additional questions in the areas of child-computer interaction and extended reality. In the past year, our team conducted research with both adult and youth stakeholders on the ethics of XR technology for neurodivergent children and adolescents. We would like to discuss, share, and reflect on these findings, as well as compare and contrast our results with similar research projects conducted by our fellow workshop participants. Additionally, we also come with three areas of investigation and questioning that we would like to pose to the larger workshop. These questions revolve around topics of design for the universal versus specific, co-creation of guidelines to engender agency, and co-creation of guidelines with multiple stakeholders.

CCS CONCEPTS

• Human-Centered Computing • Virtual Reality

KEYWORDS

Virtual Reality, Extended Reality, Ethics, Children, Family, Social VR, Neurodivergence

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1 Participation Aims

Our team would like to take part in the "Extended Reality and Children: Risks, Opportunities, and Ethics" IDC workshop for several reasons. Among our top interests is the opportunity to discuss, share, and reflect on some of our findings from recent research projects. In Spring and Fall 2024, we engaged both youth and adult stakeholders regarding their perspectives on ethical XR technology for neurodivergent children and adolescents (i.e., those who are autistic and/or have ADHD). In our research, the inclusion of neurodivergent youth voices is especially critical. Although technology for neurodivergent users is often designed within a deficit framework, the inclusion of these children's perspectives can lead to more comprehensive design considerations and novel research directions [7, 8].

Additionally, we see three major areas of investigation and lines of questioning that we would like to bring as discussion prompts: How might we strike a balance between "design for one" and "design for all" in the creation of safe guidelines? How might we co-create ethical guidelines with children and youth to engender not only their agency, but also to encourage their buy-in towards guideline participation? And finally, how might we co-create these guidelines with the multiple stakeholders involved in ensuring the well-being of neurodivergent youth?

Finally, our research team includes neurodivergent individuals who themselves have varied reflections on neurodivergent childhoods and relationships to technology. We are excited to bring these combined perspectives–both from research and from lived experiences–to the workshop and its exciting discussions.

2 Potential Contributions

Based on our current line of research, we believe that our team has much to contribute to conversations about XR child ethics. Over the last year, we have conducted two projects regarding XR child ethics.

In the first project, we interviewed neurodivergent children, showing them speculative future use scenarios of VR to identify their views on the possibilities, limitations, positives, and potential detriments of XR technology for neurodivergent children like themselves. This is in response to a similar study conducted by our colleagues, investigating ethical concerns from children's perspectives [3]. In the second project, we hosted focus groups of parents and clinicians of neurodivergent youth, showing them the same speculative future use scenarios to identify their views. This is also inspired by a related study from our colleagues, in which they led interactive study sessions with adult stakeholders on their perspectives of XR for children [2].

With the data we have collected, comparing and contrasting the positions of both the neurodivergent youth and adult stakeholders has led to fascinating insights. Additionally, when we compare the results of our studies with that of our colleagues, we can see that attitudes and ethical concerns converged in many ways. However, they still diverge notably in important respects relative to the needs and considerations of neurodivergent children.

These insights in turn inform our three core questions on ethical guidelines:

1. **How might we strike a balance between "design for one" and "design for all" in the creation of safe guidelines?**

As with all children–and with neurodiverse children especially–no two individuals are alike. Neurodivergent children are a highly heterogeneous population; each child can require varying degrees of developmental support (e.g., executive functioning), while possessing certain strengths (e.g., problem solving) [4]. Rules, concerns, benefits, and detriments will vastly vary from child to child. As a result, what may be harmful or helpful to one cannot be guaranteed to be harmful or helpful to another.

In our research with adult focus groups, this sentiment was repeated over and over: "it depends." Parents and clinicians could easily see how XR technology might help some children, providing opportunities like accessible field trips and engaging learning. They just as quickly brought up potential issues for other children, citing poor interoception and potentially addictive or dangerous behaviors.

2. **How might we co-create ethical guidelines with children and youth to engender not only their agency, but also to encourage their buy-in towards guideline participation?**

Current ethical guidelines are rarely co-created with children and may be seen as rules to be circumnavigated. In our 1:1 child interviews, some participants expressed interest in autonomy and learning from consequences, displaying strong desires for agency. These insights are critical to take seriously; doing so not only aligns with recent ethical shifts in research on neurodivergence [6], but also respond to an overreliance on adult proxies in participatory CCI research with neurodivergent children [1].

While adult stakeholders and youth may have different concerns and interests on the topic of VR technology, there are, in fact, many overlapping opportunities for collaboration on ethical guidelines. For example, both parents and children mentioned the harmful potential for VR to become addicting or to isolate its users from "the real world." Both parents and children also mentioned the powerful opportunities VR provides for safe (and unsafe) socialization with friends and family.

These overlapping opportunities, acknowledged by both children and adults, exist and can also be used as starting points of conversation. By actively involving children in the process of creating the rules that will critically affect their experiences, we can help provide agency, autonomy, and buy-in towards guideline participation.

3. **How might we co-create these guidelines with the multiple stakeholders involved in ensuring the well-being of neurodivergent youth?**

The experience of neurodiversity is broad and unique to each individual child. To know deeply what is "best" for that child, and how to best keep them safe, we must hear from the voices of multiple stakeholders: not only from parents and guardians, game developers and designers, but also from doctors, teachers, therapists–and, above all, the child themselves. Current research similarly emphasizes the need to include perspectives from multiple stakeholder groups to best reflect community goals and concerns [5].

We suggest approaching this question with notions of design and encourage iterative co-creative processes. In our research, we found that adult stakeholders repeatedly mentioned the importance of the involvement of multiple stakeholders and a child's community. Each individual carries with them knowledge, insight, and contributions specific to them. Marrying every recommendation or criteria may be difficult, if not impossible; but as we reflect on how to shape ethical guidelines in child XR, we also investigate what well-rounded, comprehensive guidelines might look like.

For XR, as with other emerging technologies, it is also crucial to acknowledge that there are institutional gatekeepers, such as companies and governments. These organizations may have goals that are not compatible with those of neurodivergent children and adult stakeholders; moving forward, it will be critical to identify, acknowledge, and iterate on potentially conflicting values regarding technology and youth well-being.

3 Future of Ethical Child XR Research

We believe that taking part in this workshop would be valuable to our team's work, and will support advancements in research into the ethics of XR for children. The desire for rules and safety is deeply human; so is the youthful desire to grow unbridled. For ethical guidelines to not only be effective, but also encourage meaningful opportunity, we need to acknowledge both of these truths (and everything in between) as researchers.

We live in a time where the development and fidelity of emerging technologies call for rigorous research and core ethical guidelines. From parent anxieties to the dangers of unregulated technology, these guidelines play a critical role as both a barrier and a safety net. And while ethical guidelines cannot prevent every dangerous or unsafe scenario for children using XR, they can absolutely help us move the needle along, continuously pushing child XR technologies from harm-engendering to harm-reduction.

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