Children's Perspectives on Ethical Issues Surrounding their Past Involvement on a Participatory Design Team

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ABSTRACT
Participatory Design (PD) gives users a voice in the design of technologies they are meant to use. When PD methods are adapted for research with children, design teams need to address additional issues of ethical accountability (*e.g.,* adult-child power relations). While researchers have taken measures to ensure ethical accountability in PD research with children, to our knowledge there has been no work examining how former child design partners view ethical issues surrounding their participation.

In this work we ask: *How do children view ethical issues around their role on Participatory Design teams?* We present findings from surveys and interviews with 12 former child design partners. Findings, identified by the former participants themselves, outline: (i) balancing attribution and anonymity, (ii) promoting ongoing consent and dissent, and (iii) cultivating a balanced design partnership. From these findings we recommend practices for researchers and designers of children's technologies that align with participant views.

Author Keywords
Participatory Design; Co-Design; Ethics; Participant Perspective; Children

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

INTRODUCTION
In an effort to protect those they hope to understand, HCI researchers strive to adhere to standards of excellence with respect to their ethical accountability towards research participants [39]. Adhering to standard ethics reviews begins these efforts. For instance, ethics principles such as *beneficence*, *justice*, and *respect for persons* are the basis of legislation that established the Institutional Review Board (IRB), which reviews and approves human subjects research in the U.S. [27]. HCI researchers have extended their concerns for ethical accountability to include the ways values with ethical import are included in the design of technologies. In fact, technology design methods that HCI researchers choose to adopt and adapt (*e.g.,* Value Sensitive Design [3, 14], Participatory Design [16, 29]) deliberately include values of ethical import.

Figure 1. Adults and children work together during a Cooperative Inquiry session to prototype new technologies for children.

Researchers striving to maintain ethical accountability can face additional challenges when including children in methods of design research, such as Participatory Design. For instance, researchers' commitment to *respect for persons* in the form of informed consent has traditionally focused on whether children are cognitively able to consent to participation [28], and how to facilitate children's assent to participation while a parent or guardian remains responsible for legal consent [8]. Concerning informed consent in design research with children, there has been recent discourse on the challenge of making sure children understand how their ideas are incorporated into the designs to which they are contributing [18, 32].

To address these and other challenges in design research with children, researchers have taken measures such as the development of techniques to help explain the goals and outcomes of studies to children [12, 33]. Researchers also

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monitor the effectiveness of measures toward ethical accountability while working with children in designing technologies. The efforts of researchers have been validated through pre-study preparations, such as compliance with standard ethics reviews, and by examining study outcomes and participant feedback, such as investigations into the impacts participation may have had on participants [4, 17].

In this paper, we continue this discussion by surveying and interviewing former participants of a Participatory Design (PD) team, giving them the opportunity to explicitly express their views on ethical questions traditionally left to the interpretation of researchers and practitioners. We asked the question: *How do former child participants view the ethical issues around their role on Participatory Design teams?* Twelve former participants with 1 to 5 years experience on a PD team were surveyed, and 6 were further interviewed. Their removed, and in some cases adult, perspectives on these issues lends a new point of view to the discussions of ethical accountability in HCI research.

Results from this study contribute to the discussion of ethical considerations for research practices based on the perspectives of former child participants on a Participatory Design team. Specifically, we outline issues that former participants themselves identify, namely issues of (i) balancing attribution and anonymity, (ii) promoting ongoing dialogues about consent and dissent, and (iii) cultivating a balanced design partnership. We also present implications for research and design practices that are supported by our findings. These results will be useful to researchers, designers, and other stakeholders involved in design research with children.

RELATED WORK

In this section we (i) review how PD has been adapted for use with children, (ii) describe the PD team in this work, and (iii) discuss concerns related to the inclusion of children in PD research that have ethical implications.

Participatory Design with Children

Scandinavian PD grew out of a democratic movement to give factory workers a voice in the design of technologies intended for their use [2, 16]. Partially because of its strong emphasis on valuing user participation, democracy in design, and techniques that facilitate the inclusion of these values in the design process, this method has been adapted by researchers to give children a voice in the design of the technologies they are meant to use [9]. The goal of adapting the PD method for work with children is to achieve *"…results in technologies that better address [children's] needs, interests, and abilities"* [21, p.313].

Several research methods for including children in the design process have been derived from or influenced by PD. The method of Informant Design involves children in the design process at key points when researchers feel their feedback will be most impactful in an expeditious fashion; usually this inclusion ranges from one to a few sessions [34]. The method of Bonded Design is used to address a specific design problem during an intensive short-term partnership with children, typically running the course of a few weeks [25]. The method of Cooperative Inquiry includes children in the design of many technologies throughout their iterative cycles with a team that meets regularly throughout the course of a year [9, 19].

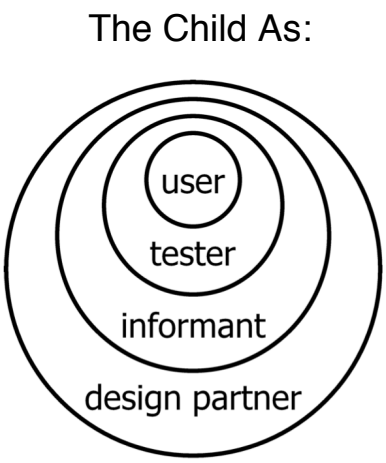

Figure 2. Druin's continuum illustrating the relationship between the four roles children can have in the design of new technologies for children [10].

In terms of the degree of children's involvement in these design methods, the roles children have when participating in these processes can range from the roles of *User* or *Tester* at the end of a product life cycle, to involvement throughout the design process in the roles of *Informant* or *Design Partner* (Figure 2) [10]. The goal of Cooperative Inquiry (CI) is to accomplish the latter, giving children a strong voice in the design of technologies that are to be used by children by incorporating them into the design team as full design partners [9, 10, 19]. In CI, children and adults work together on a team to design new and improve upon current technologies. These teams meet regularly over the course of a year and oftentimes participants choose to participate for multiple years [12, 40].

The Design Team

To provide context for this study, we discuss the history of the team, provide examples of technologies the team has helped design, and provide an overview the design team's current practices.

History. This work focuses on a CI design team called Kidsteam, which has met twice a week throughout the academic year for the past 18 years. The team also meets for two weeks each summer to facilitate team building, meet new members, and learn design techniques. Approximately eight children age 7-11 participate on the team at a time with adult researchers from diverse professional backgrounds. On average, children participate on the design team for 1.8 years (*SD*=1.0, *median*=2.0). The child design partner alumni of *Kidsteam* number more than 50, and many of the former participants are now adults (*i.e.,* age 18+).

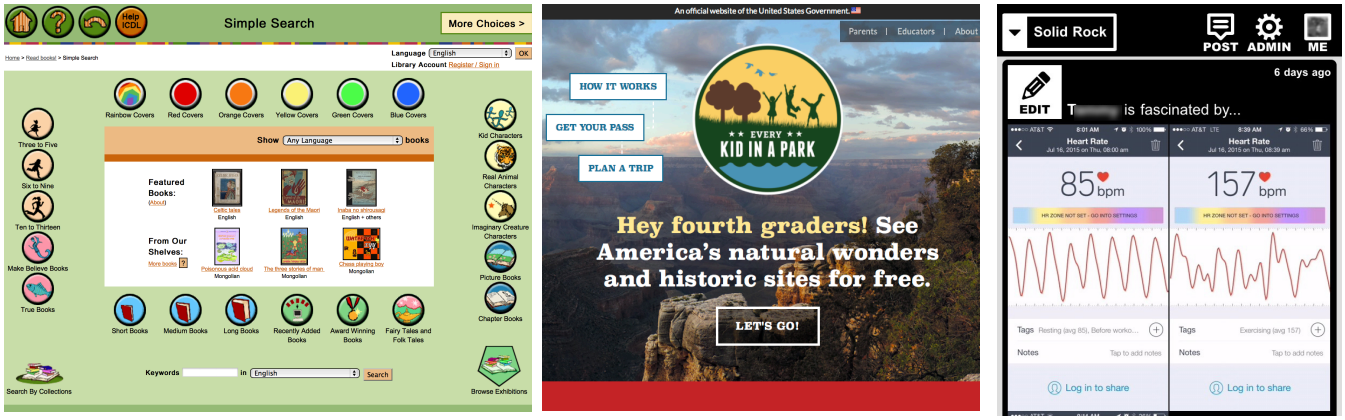

Figure 3. Technologies child design partner alumni have worked on. Left to right: The International Children's Digital Library, which provides worldwide access to children's books [22]; The Every Kid in a Park website [37], which provides passes to 4th grade children to visit US national lands and waters; and ScienceKit, which supports science inquiry learning in everyday life [41].

Project Types. *Kidsteam* alumni have been involved in the design of numerous children's technologies spanning industry and academia. For example, the website for America's Every Kid in a Park initiative was designed with Kidsteam (Figure 3) [37]. Researchers in the Human-Computer Interaction (HCI) and Interaction Design and Children (IDC) fields have been able to provide recommendations for the design and development of technologies through their work with Kidsteam, particularly in the areas of storytelling [23, 31] and STEM education (Figure 3) [41, 7, 26].

Current Practices. Consent is obtained from the parents of each child participant at the beginning of each year of participation. Snowball sampling is used to recruit child design partners and, as a result, it is common for children to have relationships with university faculty or to have pre-existing relationships with other children on the team. At the end of each year, children are directly asked to consider whether they want to return to the team the following year. Adult design partners attempt to provide an environment where all members have an equal voice in the design process of the session, while maintaining some traditional aspects of control (*e.g.*, timing design activities). The team works with outside partners such as Nickelodeon and the United States National Park Service. The outcomes of design sessions result in recommendations for the design of technologies, which may be incorporated into publically released products and/or presented in academic research papers. These materials may contain photos of the participants. Finally, attribution for ideas in these materials is given to the *Kidsteam* team as a whole.

Ethical Accountability in PD Research with Children

Protecting the rights of human subjects in research is frequently discussed in regard to three foundational principles set out in the Belmont Report: adhering to *beneficence* though measures that address risks and benefits, adhering to justice through ensuring procedural fairness, and maintaining *respect for persons* through measures that promote informed consent to participation [30]. Here, we discuss issues related to these principles as well as other issues of ethical import that are salient to conducting PD research with children, including: *Consent, Anonymity, Adult-Child Power Structures, Participant Experience*, and *Use of Ideas* [13].

Consent

As part of commitments to respect for persons, researchers working with human subjects are required to obtain informed consent [1]. Children cannot legally sign a consent form, and parents must and should be properly informed to give consent for their child's participation [6]. Children can provide assent, which is a non-contractual, usually verbal, agreement to participate that is specifically delivered in language children can understand [8]. Existing social research theory argues that obtaining assent must be an ongoing process [6, 28], a point that has increased relevance with respect to PD research methods where involvement can span multiple years. The variety of possible outcomes of design partnerships (*e.g.,* published papers, new technologies) adds a layer of additional complexity in obtaining assent from children, as descriptions of these outcomes must be explained to children as well as the design processes and activities that they will be undertaking [33].

Dissent. As with consent, allowing dissent during the research process is vital to researchers' responsibilities [6], and has increased relevance to long-standing relationships. In a long-term research partnerships, researchers need to be attuned to forms of verbal and non-verbal dissent as well as the part of a design session that a participant may be dissenting to (*e.g.,* particular projects, techniques).

Anonymity

A common strategy used in adhering to ethical principle of beneficence is to maintain the anonymity of individual participants to protect them from harm [27]. Issues of consent and assent with children can have implications for

anonymity. When researchers find it necessary to use a participant name in the reporting of their research, it is common practice to substitute pseudonyms for actual participant names. While consent to use an image may have been obtained from a parent, assent from children when using their likenesses may not be required to publish an image that may reveal their identity. In efforts to address this issue, when using images to illustrate research that is being done, many researchers will photograph children from the back (see Figure 1 for an example). Such practices may reduce the usefulness of the image if pictures from behind do not fully express an experience.

Adult-Child Power Structures

When working with children in participatory research, Morrow and Richards assert that overcoming unequal power structures between children and adults is the biggest ethical challenge researchers face [28]. Thomas expounds on the importance of this issue, "in order to enable children to participate on their own terms" [36]. This concern echoes values inherent in Scandinavian PD processes, which require a balance of power structures so that all participants have a legitimate voice in the design process [24]. However, in most aspects of a child's life adults are authority figures (*i.e.*, parents, teachers, etc.) who possess the decision-making power. Due to these relationships, some researchers contend that balance of power between children and adults is not possible [25]. In previous work on CI, Guha *et al.* have qualified how to address adult-child power structures in this method, stating that, "*we do not try to change all pre-existing adult/child relationships, merely the ones that exist in the context of the design process"* [19, p.18]. The goal is to uphold children's right to participate on their own terms and have a legitimate voice in the design process, while maintaining aspects of authority outside the design activities during of each session, such as planning the design activities and maintaining a safe environment for all partners.

Domain Knowledge. Another potential contributor to unequal adult/child power structures, and therefore a barrier to giving all participants a legitimate voice in the design process, is a lack of domain knowledge. As Scaife *et al.* detailed: *"…[children] neither have the time, knowledge or expertise to participate in the collaborative model prescribed in PD approaches"* [34, p.344]. While the goal of design teams is not to create experts in every domain [19], the need for domain knowledge—for both adult and child design partners—must be addressed. CI sessions include a period of discussion between the entire team regarding the content of the session's activities to introduce new topics [12]. External domain experts may also work with the team to supply information the team requires.

Participant Experience

Understanding how the research process impacts participants is critical to the ethical accountability of the researcher [20]. Garozotto focused explicitly on educational benefits that children can derive as experience design partners [15]. A three-month study with 10-11 year olds found that children's inclusion as experience design partners may promote skills such as collaboration, communication, and critical thinking [15]. Bossen *et al.* found gains from Participatory Design participation in the area of competence with new technology [5]; however, they also note that there can be some barriers to positive experiences for children on PD teams, including misalignment of stakeholder goals [4]. Guha found many generally positive experiences for children on a Participatory Design team, including those in the areas of communication, collaboration, and cognitive skills [17].

Use of Ideas

Maintaining the values of PD that give end-users a legitimate voice in the design of technologies they are meant to use requires researchers to be conscientious in their inclusion of the ideas that are generated during each design session. Researchers have approached this process in several ways. Read *et al.* created checklists called CHECk1 and CHECk2 to make sure, at the outset of a project, that research processes are clear to children, such as how their ideas will be incorporated [33]. Members of this team also created a technique called TRAck [32] to ensure fair representation of ideas that large numbers of child participants contribute during design sessions. In design sessions that include fewer participants, such as those that occur when using the method of Cooperative Inquiry, processes such as Idea Elaboration can be used to the include ideas generated by the entire intergenerational design team [11, 19]. Idea Elaboration is the process of concurrently building upon a design with another person or persons, with each individual contributing new components to a single collaborative design [19].

In summary, researchers working with children in PD navigate numerous ethical challenges. This work discusses participant views on how these issues should be navigated.

METHOD

This work represents the first phase of a larger study investigating PD practices and working with children. To understand how children view ethical issues around their role on PD teams, we conducted an online survey with former child design partners of Kidsteam, followed by interviews with a subset of these participants.

Surveys

Participants. Former child design partners were recruited for an anonymous online survey by emailing their parents and asking them to pass on the invitation to their children. Two potential participants were not included due to a conflict of interest. Outdated contact information (*e.g.,* work emails that were a decade old) prevented us from contacting at least 23% of the parents of the 56 eligible alumni. This resulted in 12 former child design partners (3 male) completing the online survey (21% response rate). Survey participants were members of Kidsteam for, on average, 2.3 years (*SD*=1.3) and at the time of the study four of these alumni were adults (age 18+). Survey

participants included child design partner alumni who represented participation on the design team between 1998, when the program began, and 2013.

Procedure. Two survey instruments were created; one for child design partner alumni who were over the age of 18 and another for those who were under age 18 that required parents to consent and read an assent script to their child. Each survey began with a demographic questionnaire, was designed to take no more than 15 minutes to complete, and asked identical questions. Questions were designed to investigate the general experiences and expectations of the participant in regard to their former PD team participation to prompt for reflections on subjects from the literature. The surveys included Likert-style items and open-ended response questions. Participants were not compensated.

Interviews

Participants. After completion of the online survey, participants had the option to sign up to participate in a follow-up, semi-structured interview. Seven child design partner alumni volunteered to participate in the follow-up interview; of these, the six participants (one male, five female) that best represented variety regarding the number of years as a member, time since participation, and gender were chosen for subsequent interviews. Interviewees were members of *Kidsteam* for an average of 2.0 years (*SD*=1.1) and, as a group, they represented participation on the team between the years of 1998 and 2012. Half of the selected participants were currently adults (age 18+).

Procedure. Participants completed the follow-up interview at a location that was convenient to them, either on the university campus or via a videoconferencing service (*e.g.,* Skype). Participants did not receive compensation. Parents of participants who were under the age of 18 could choose to be present during the interviews with their children as long as they agreed not to participate. The semi-structured interviews lasted approximately 40 minutes and allowed us to pursue themes that were not addressed by the survey. Some topics-- including consent, anonymity, and domain knowledge-- were exclusively covered in interviews. Participants agreed to be audio recorded during the interview in the consent and, as appropriate, assent processes. Interviews were transcribed for analysis.

Analysis

Our primary analysis consisted of the qualitative coding of the open-ended survey question responses and interview data. Following a method of coding prescribed by Straus and Corbin [35], a researcher began analysis by open coding the open-ended survey questions. This data was then iteratively categorized through two coding checks with the research team. An initial codebook was developed through combining codes that represented the results of the research group discussions, such as *Respect* and *Relationships with Adult Design Partners*, with ideas drawn from research literature, such as *Use of Ideas* and *Domain Knowledge*. This process resulted in an initial codebook containing 23 codes and their definitions, grouped under eight categories: *Relationships, Projects, Incorporation of Ideas, Security and Consent, Fun, Knowledge and Skills, Confidence,* and *Social Interactions*. The codebook went through an additional coding check with the research team to refine and clarify codes, resulting in 20 codes within the eight categories. The refined code set and code definitions formed the final version of the codebook.

Participant ID	Gender	Years a Member	Currently An Adult (Age 18+)
S1	Female	1	Yes
S2	Female	3	Yes
S3	Female	2	Yes
S4	Male	4	Yes
S5	Female	2	No
S6	Female	1	No
S7	Female	2	No
S8	Female	3	No
S9	Female	1	No
S10	Female	1	No
S11	Male	2	No
S12	Male	5	No

Table 1. Survey participant demographics.

Inter-Rater Reliability was then computed between two researchers on a random selection of 20% of the short response survey data and two randomly selected, transcribed interviews. Researchers achieved a score of .92 using Cohen's Kappa, as calculated within NVivo software, considered *almost perfect agreement* (range: .81 to .99) [38]. Having reached agreement, one researcher proceeded to independently code the remaining corpus of open-ended survey response and interview data.

To compliment this analysis, we provide responses to closed survey questions in our findings. All responses to Likert-style survey items are based on a 5-point scale, with 3 being neutral, and are reported in terms of average (*M*) and standard deviation (*SD*).

FINDINGS

In this section we present our findings around children's perceptions of ethical questions in PD practices. The illustrative quotes in this paper represent themes from the collected data. We identify the source of quotes by the data source (*i.e.,* S for survey and I for interview) and participant number (*i.e.,* 3). For example, the third child alumnus to respond to the survey has the identifier "S3".

Consent

Interview participants stressed that the details of informed consent were the responsibility of their parents and that they were comfortable relying on their parents to provide this consent. For instance, when prompted specifically about their parent's consent to the potential use of their likeness in publications all (6/6) interview respondents

indicated that they were fine with images of them as children being published. I2 summarized this idea when discussing research publications, stating:

> *"Well I'm okay with it 'cause I knew my parents were okay with it. ...And the techniques they used for the research papers, I was okay with that because it was during sessions and we gave them permission." (I2)*

In this participant's description of informed consent, there was a notable transition between the idea of permission coming from a parent (e.g. "my parents were okay with it") and permission coming from the parent and the participant (e.g. "we gave them permission"). Two participants went on to elaborate that the use of their image in academic publications was comparable to other experiences they had with clubs in which they had been members. For example, these clubs may have used their images in county newspapers or promotional flyers.

During discussions on their current thoughts about what was consented to on their behalf, two participants discussed times when they would have viewed the use of their information as inappropriate. Both participants described how using photographs that showed the likeness of children on the team would be only acceptable as long the images were not used, "in a judgmental context" (I5) or were not "embarrassing" (I1). Participant I1 also went on to explain that quoting statements she made as a child in publications was only acceptable so long as the statements were not personally embarrassing.

Dissent

Participants were asked if they had thought they could stop participating during parts of a session, for an entire whole session, or to leave the team entirely. Half of interview participants (3/6) explicitly described "never" wanting to stop participating in a session, as I3 stated, *"I think it was too fun to ever think of [not participating] for me."* I2 elaborated, describing that even if it was an "off day," participating was still desirable and acceptable to the team: *"I didn't bring my best ideas but it was still okay."*

The other half of interview participants (3/6) did not state that they wanted to stop participating during a session (or a part of a session), though they did describe a design technique or a recurring project that they did not enjoy. When asked if they would have felt comfortable not participating in these activities (*i.e.,* to dissent), they provided two reasons why they felt that this would not be possible. First, the participants said that not participating in a single session would not be possible due to logistical concerns (*e.g.,* needing their parents picking them up). Second, the participants described that the project or technique being used was a temporary inconvenience. Regarding these inconveniences, I4 explained:

> *"I enjoyed Kidsteam and I wanted to come back for future days, but it was like, I know we are doing the library [project] today. So instead of being more like, 'I'm going to quit today,' I'd be like, 'I'm going to go today because the next day it may be better.'"*

This suggests that child design partners might consider long-term benefits to their participation on the team and weigh them against short-term inconveniences, which may allow child design partners to set aside any less enjoyable aspect of the experience.

Ultimately, most interview participants (5/6) ended their participation on the team when the academic year ended, at the end of the consent period. One participant ended participation after an extended break between semesters. All interview participants described leaving the team to focus on other interests, such as hobbies or schoolwork, and two thought they were getting too old for the team.

Anonymity

Interview participants indicated different attitudes toward practices that relate to anonymity. In the previously reported findings on informed consent, participants indicated that the use of their likeness in publications, which may make them personally identifiable, was acceptable. However, two-thirds of interview participants wanted to remain anonymous with respect to the release of publications and other materials that might identify them by name. This is the practice required by standard ethics reviews and it complies with ethical practices upholding the principle of beneficence. Interestingly, some interview participants indicated in their comments that this preference was complicated by other considerations. For example, when asked if they preferred that their identity be kept anonymous, I3 stated, *"I don't know, probably anonymous. I don't want people to give me all the credit for just creating a simple idea."* This response was typical from participants and indicates that they perceive a relationship between wanting to maintain a degree of anonymity and wanting to balance attribution.

Adult-Child Power Structures

Participants in this study indicated the relationship that they had with other adult and child design partners was positive and respectful. According to the survey data, all child design partner alumni described their relationship with adult design partners as being respectful, with an average agreement score of 4.72 *(SD=0.52)*. Additionally, survey participants reported that their relationships with adult design partners and child design partners were similarly positive (M=4.00, SD=0.89 and M=3.8, SD=0.75, respectively). Survey and interview participants attributed this relationship to factors such as environment, *"The setting was very comfortable"* (S3), and feeling that adults were friendly toward them, *"Because it was very casual in a way that you could call them by their first names and that kind of made them more approachable."* (I2). The overall environment, as S12 described, was that, "*The members of Kidsteam were like a big group of friends that you worked with to solve problems."*

Additionally, survey and interview responses indicated that child design partner alumni recognized that adult design partners carried additional responsibilities (*e.g.,* making sure design sessions ran on time), but did not believe this influenced their ability to participate on their own terms when designing technologies. When interview participants were asked whether the responsibilities adults had during the sessions, such as structuring sessions, impacted their ability to have an "equal" partnership in creating design ideas, none believed it was an influencing factor. I6 stated, *"No I don't think it ever influenced us at all."* Similarly, I2 specified that,

> *"The adults just told us what [the design session] had to be about. They didn't tell us what we couldn't do or could do… Of course there were times when they had to be like, 'we have to stop now.'"*

Domain Knowledge

Interview participants indicated that they were provided with the basic knowledge they needed to participate in design sessions as partners with adults. The majority (5/6) of participants described how adults either "always explained" what the session was going to be about or that adults were available to help when needed. I2 summarized this by stating,

> *"They always explained what we were going to do, what was the background and everything. So after that we got a pretty good idea what was going to happen and what we needed to do."*

One participant went so far as to say that, *"I think I felt like there was nothing we couldn't work on"* (I1). However, another participant suggested that domain knowledge could not always be sufficiently provided by the design team:

> *"We had Nickelodeon…a bunch. I didn't know anything about Nickelodeon. ...The other kids who had grown up with Nickelodeon would participate more because they were more familiar with it… They could be like, 'oh blah dee blah can go here,' with the characters. I couldn't do that because I didn't know them." (I6)*

Participant Experience

While positive experiences were not universal, due to aforementioned issues such as not liking to use a specific design technique or working on a specific piece of technology, participants described an overall positive experience on the design team. In their survey responses, participants indicated that their experience on *Kidsteam* was positive, with an average agreement score of 4.54 *(SD*=0.52*)*. S4 stated, for example, that, *"My Kidsteam experience was some of the best times I ever had."* Statements like this were representational of the group's responses to experiential questions.

The use of certain techniques and the opportunity to work on certain projects were central in descriptions of participants' positive experiences. For instance, I4 stated, *"I remember Bags of Stuff was my favorite thing to do,"* and later returned to this idea, stating, *"I certainly liked the hazard stuff. Also, the group discussion where [adult researchers] take our Sticky Notes. And, the Bags of Stuff."* In the later statement, I4 re-emphasized that particular techniques that were enjoyable, the Sticky Note prototype evaluation technique [40] and The Bags of Stuff low-fidelity 3D prototyping technique [40]. The participant also described a liking "the hazard stuff," which was a specific project that investigated how to create outdoor hazard signs that children would understand. Similarly, I1 described how experiences working on a specific project were foundational to reflecting on the design team experience positively: *"I was so proud of the Animal Blocks. Even to this day I think about how I got to impact that. In fact it felt really cool to have that opportunity."*

Use of Ideas

Overall, participants believed their ideas were valued, understood their usage, and were motivated by the ways their ideas could be used. A majority of survey participants (9/12) believed that the team used their ideas directly or through synthesis with other team members' ideas. Survey participants also felt that it was important for the team to hear their ideas (*M*=4.30*, SD*=0.48). Additionally, participants agreed with the statement that their ideas were important to the team (*M*=4.10, *SD*=0.32*)* and that their ideas influenced the direction of the projects they worked on (*M*=3.90*, SD*=0.56*)*.

In addition to indicating a belief that their ideas were important and useful, participants also described an understanding of the Idea Elaboration process that shaped how their ideas would, or would not, be implemented. I6 specified how ideas were used when stating that,

> *"We (Kidsteam) would always try to just combine ideas so there was never one above the other, it was all just equal. Sometimes ideas I had worked and sometimes they didn't and we'd solve it and move on. So if an idea I had didn't really work out we'd scrap it. It wasn't a big deal."*

Similarly, S10 described how children and their teammates co-created successful designs: *"Many of the ideas that I have inputted have been seen in public, like the 'Do Not Touch' button. I may not have created the idea, but I certainly supported it."* During this process, it was also expected that, *"If [the team] worked on a project for two sessions, the ideas from the first session were present the second time"* (S12). Not meeting this expectation could cause frustration. Participant I5 described a series of design sessions where an external partner did not, *"incorporate any of our ideas or make [the technology] look more like the iterations we thought were best,"* and yelling at the partner because of this, saying, *"You're evil!"*

With regard to ideas that are disseminated publically, participants implied that they understood and were motivated by the potential for their ideas to be used in technologies with wide reach. Discussing motivation for

participating on the design team in general, I5 described, *"If I didn't go [to Kidsteam]… I'd go back to being an ordinary citizen with no impact on the world."* Discussing the partners the team worked with (*e.g.,* the US National Park Service), survey participants indicated that they liked that partners could use their ideas (M=4.00, SD=0.94*)*. S10 described liking the additional impact these contributions could have, as, *"[The kids] knew that those partners had a higher chance of making our ideas public."* As an example of this impact, S8 described that, *"During my time we improved the National Park Service's website."* Additionally, all interview participants who mentioned external partners (5/5) found the potential to impact the designs of external partners to be both exciting and motivating. I5 encapsulated this idea, stating, *"I thought it was very cool that we had external partners that would use ideas for very big things."* One participant described a more direct motivation:

> *"We'd get to design things for companies and groups such as Nickelodeon and the [US] National Park Service. I was motivated because we'd get to work with these big groups" (I2).*

Attribution

Participants described very specific desires for external attribution. All interview participants suggested that the idea of receiving public, individual credit for their ideas was unnecessary. One participant expressed concern over potential ramifications of having *"kids' names out there,"* suggesting, *"it doesn't seem like a good idea"* (I5).

Half (3/6) of the interview participants suggested that the team as a whole should receive credit for contributions to the design of a technology they work on. I2 provided an example of this perspective, stating: *"I think Kidsteam in general should be recognized because it wasn't just a single effort, it was a team effort."* Individual credit for their contributions to technologies the team worked on could then be obtained as desired through self-identifying as a member of the design team, as participant I5 described:

> *"The kids can take credit all they want to their friends and parents' friends. [They can] say, 'These people work with Kidsteam, and I'm a member of Kidsteam."*

Furthermore, one-third (2/6) of interview participants described how the Idea Elaboration process that the team used would prevent individual attribution from being possible. *"It's hard to say exactly who had what idea. There was so much combining ideas so I don't feel like there needs to be specific credit"* (I6).

In addition to the external attribution participants receive, one interview participant expressed a desire for additional internal attribution, suggesting child participants be given a commemorative plaque or that photos of the design team be hung on the lab's walls.

Summary of Findings

Through surveys and interviews, we have gathered an important perspective on the ethical considerations surrounding PD: that of the participants. We learned that child design partners felt comfortable relying on their parents to provide informed consent. Participants did not describe a desire to dissent to design sessions in whole or in part; however, they were unlikely to do so due to external considerations (*e.g.,* scheduling logistics) and their feelings of commitment to the team. Child design partners on Participatory Design teams also indicated that they were more interested in having attribution for their designs go to the team rather than to the individual members. This desire was jointly linked to concerns about maintaining anonymity and the ability to determine where individual credit would come from in the elaborative process used by the team. Concerning anonymity, participants presented diverse opinions ranging from desires to maintain partial anonymity to full anonymity. Our findings indicate that participants felt personally respected during their time as a design partner and felt that their ideas were treated equally with respect to any other partner's. Children also did not feel limited in their ability to design technologies by a lack of domain knowledge. Finally, the participant experience was generally positive.

DISCUSSION

The increased involvement of children in design research magnifies already complex issues of ethics and values underlying the design processes. Power structures must be continually addressed, domain knowledge for individual design sessions must be consistently provided, opportunities for assent and dissent must be consistently monitored, and participants must be made aware of the diverse uses of their ideas. In this work, we tie the voices of former child design partners to these issues to better improve our understanding and further enable researchers to "do more" than the base requirements of ethical accountability. Here we discuss our findings as they relate to three topics: (i) finding a balance between attribution and anonymity, (ii) promoting ongoing dialogues about consent and dissent, and (iii) cultivating a balanced design partnership. We then recommend research practices that align with both the goals of PD research and with the desires of child participants.

Balancing Attribution and Anonymity

Legal and ethical requirements rightly protect the anonymity of research participants [27]. However, when the involvement of children in research moves into the creative sphere, as it does with Participatory Design methods, issues of attribution arise. *Do child participants want to receive credit for their designs, regardless of what parents have consented to on their behalf? If so, is it possible to balance attribution for creative contributions with protecting their identities?*

Being a member of Kidsteam was a source of pride for many former child design partners, and therefore many

desired some form of attribution for their work. Our study suggests that public attribution for contributions should be given to the team as a whole. Participants described this method of attribution as having two benefits: protecting anonymity and maintaining accuracy. With respect to protecting anonymity, participants in this study described how crediting the team protects their individual identities by keeping their names private, particularly on projects that were "larger." Participants felt this form of attribution provided them with a degree of discretion, as they described how this measure allowed them to decide who knew they participated on Kidsteam or what projects they were contributing to. Participants also described how this form of credit most accurately represented who deserved the attribution, which here refers to the entire team as opposed to a single member.

We believe that the preference for team attribution was related to the participants' understanding of how their ideas were included in the Idea Elaboration processes. While other methods of PD with children allow for the tracking of individual ideas, and therefore makes individual attribution possible, the method of Cooperative Inquiry relies on Idea Elaboration [12, 19] and individual contributions were perceived as being somewhere between difficult and impossible to determine.

Promoting Ongoing Dialogues on Consent and Dissent

Consent to participation in research activities should be an ongoing process [6, 8]. While yearly renewal of consent may not be required by all standard ethics reviews, participant feedback suggests that natural breaks, such as the end of a consent period or a break between semesters, provided a natural end point where they could comfortably leave the team to pursue other interests and activities.

While some design partners described always wanting to participate, and therefore had not faced issues pertaining to dissent, others described techniques or projects that were not enjoyed. These elements of participation were approached with the mindset that, while a particular day's activity might not be enjoyable, the next session's activities would likely be better. Nonetheless, dissent is defined as being, "the capacity or *opportunity* to say or express 'no,'" [6], and the comments of participants leave us wondering if the design partners who described not liking a particular project or technique fully perceived their opportunity to dissent to different aspects of participation. This particular issue is one with nuance that is unique to design research, and suggests that all PD researchers who work with children should consider issues of dissent thoroughly.

Children may feel unable to dissent because of the context of the situation and the power structures that exist outside the area of designing: *Would their parents be upset, or able to pick them up early?* In a long-term partnership, children may also be disinclined to dissent because they want to participate in the next session, and, correctly, consider the current "obligation" to be temporary. These considerations suggest that additional mechanisms to allow for child dissent in design research may be necessary, if potentially undesirable to a researcher. Pragmatically, we may only have a single session or a couple of sessions to work with children on a specific technology and may be depending on their input. Nonetheless, we have a responsibility to gauge children's ongoing assent to participation and need to facilitate environments where they understand, and are comfortable, dissenting.

Additionally, researchers engaging in long-term PD research have to be perceptive enough to consider whether or not an "off" day indicates that the child is unhappy with participation overall. Our participants suggest that, while child design partners may have "bad days," they still want to participate on the team. Accordingly, participants should not be asked to leave a design team or be perceived as dissenting to participation based on one difficult design session. Instead, researchers must assess the situation to determine whether or not this is a temporary state that needs to be accommodated.

Cultivating a Balanced Design Partnership

The first, and most substantial, step toward helping children develop an understanding of the democratic process that underlies how and why they engage in PD is addressing power structures of the adult-child relationship. This work suggests that through a PD approach to design, child design partner alumni related to the adult design partners they worked with in a manner similar to how peers are described in constructive workplaces: respectful, positive, and balanced. Participants recalled endeavors that researchers deliberately put in place to address power structures and noted that they increased their comfort during the design sessions. The measures participants recalled were simple ones, such as wearing casual clothing and using first names, and can be easily applied to PD research methods adapted for use with children [9].

Another essential component of minimizing power structures, toward the goal of achieving balance in a design partnership, is making sure that child participants know that their design ideas matter just as much as the ideas of other stakeholders. The feedback from former participants in this study agrees with reflections from other researchers about their PD processes, namely, that: *"The Scandinavian approach effects the power relations among stakeholders and provides children with a legitimate access to the decision-making process"* [24, p.113]. Our work demonstrates that participants not only understood the Idea Elaboration process used by the design team— to the extent that they knew not all ideas generated would be used in a resultant design— they also *expected* that the most commonly agreed upon ideas among the entire team would be part of the final technology, or the next design iteration that they were asked to work with. Connecting the teams' ideas to features that were implemented in the next iteration of a technology or to technologies that were publically released was one of the most common ways participants

described their positive experience on the PD team. The pride felt in participating on a PD team was linked to participants' ability to have a real-world impact.

Recommendations

Through surveying and interviewing former child participants Kidsteam, our understanding of issues with ethical implications in PD has increased. Based on participant feedback, we present recommendations for researchers and designers who seek to conduct design-based research with children in a manner that aligns ethical practices and the desires of child participants.

Anonymity

- Maintain standard practices that prevent participants' names from being revealed.
- Provide attribution through crediting the design team as a whole, preventing personally identifying information from being released.

Consent and Dissent

- Establish a natural end point where participants can leave long-term design teams.
- Be sensitive to dissent that may only apply to parts of a single session, or to a single project.

Power Structures

- Interact with children in a positive, respectful way to encourage dialogue.
- Remind children that their ideas are important to resultant designs and that they will be used to improve the technologies they are working on.
- Create a comfortable environment by wearing casual clothing and addressing each other by first name.
- When introducing design topics, include the domain knowledge necessary to participating.

Use of Ideas

- Clearly articulate the process that is used to incorporate team members' ideas into technologies.
- Describe the real-world impact or public reach of design ideas.

Limitations

We acknowledge several limitations to this study. While the participant perspectives described in this work may be valuable to any researcher including children in PD, these findings are described through the lens of participants who were members of a Cooperative Inquiry team, which emphasizes long-term relationships with design partners.

It is possible that the participants who chose to take the survey and sign up for the subsequent interviews were more willing to respond due to a positive recollection of their experience. During the study, we asked participants to describe past events; therefore, recall bias is also a concern, particularly for participants that were asked to think as far back as 18 years ago. To minimize this potential source of error, former child design partners were both surveyed and interviewed. The respondents were also largely female in both the survey and interview participant groups, introducing a gender skew into our results. Additionally, the small sample size of our participant population is limiting. This sample size can be partially attributed to having outdated contact information.

While none of the child design partners had a relationship with the interviewer during the time they were child participants on the design team, one interview participant had a prior adult working relationship with the interviewer. While this participant may have been less likely to provide negative feedback, this participant, unprompted, asserted at the outset of the interview that the feedback given was, *"going to be candid."*

Future Work

The current work is a retrospective appraisal of ethical practices. Future work should study issues with ethical implications as they occur on the design team as well as necessary interventions. The ways former child participants perceive the ethics of other types of PD, such as Informant Design or Bonded Design should also be a focus of future studies. Lastly, the recommendations derived from this work should be investigated to determine whether they might apply when working with other vulnerable populations where power structures should be considered, such as peoples with intellectual disabilities or communication difficulties.

As previously noted, this work represents the first phase of a larger study investigating PD practices and working with children. Future work on the perspectives of former participants should focus on the life cycle of design partners, investigating why design partner alumni return to participatory design teams such as Kidsteam as teens and adults. Future work should also explore the long-term social and cognitive influences that former child participants attribute to their participation on a PD team.

CONCLUSION

Understanding how participants view ethical issues around their participation in a research process is a necessary step for researchers in understanding the success of ethical accountability practices. In this work, we present the first assessment of how child design partner alumni perceive the ethical issues around their involvement in PD teams. Our findings indicate that former child PD participants desire a balance between receiving credit for their design work and maintaining their anonymity, that promoting ongoing dialogues about consent and dissent has unique considerations for design teams that work with children, and that it is possible to cultivate a balanced design partnership between adults and children. These findings and the subsequent recommendations will benefit other HCI researchers and industry practitioners involved in PD and, more broadly, designers of children's technologies.

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