Streets for People: Engaging Children in Placemaking Through a Socio-technical Process

Sean Peacock, Robert Anderson and Clara Crivellaro

Open Lab, Newcastle University

Newcastle upon Tyne, UK

{s.peacock, rob.anderson, clara.crivellaro}@newcastle.ac.uk

ABSTRACT

In this paper, we present a socio-technical process designed to engage children in an ongoing urban design project—*Streets for People*—in Newcastle, UK. We translated urban design proposals developed by residents and the local authority to enable children to contribute ideas to the project. Our process comprised three stages: situated explorations and evidence gathering through digitally supported neighbourhood walks; issue mapping and peer-to-peer discussions using an online engagement platform; and face-to-face dialogue between children, residents, and the local authority through a ‘Town Hall’ event. We report insights gained through our engagement and show how our activities facilitated issue advocacy and the development of children’s capacities, but also surfaced tensions around the agency of children in political processes. We reflect on the challenges of working in this space, and discuss wider implications for technology design and ethical questions that ‘scaling up’ such work might pose.

Author Keywords

Community engagement; Children; Digital civics; Urban design; Urban planning

ACM Classification Keywords

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

INTRODUCTION

There is a long history of local authorities engaging citizens in decisions on how urban areas can be shaped for the benefit of future generations. However, children rarely help make these decisions, despite having to deal with the consequences for the rest of their lives [9,20,25,42]. Furthermore, children’s lack of representation in these decisions can often discourage them from taking ownership of their community and reinforces the false perception that children are disinterested in the political processes happening around them [5,27,35]. That they remain marginalised in urban design processes is symptomatic of a failure of current engagement methods employed by decision-makers to appeal

to children’s lived experiences or appropriately communicate formal and technical urban design proposals in a way that children can meaningfully engage with [66].

It is of growing importance to the HCI community to look at ways of designing technology to support the participation of a wide range of citizens in civic decision-making [4,7,63]. Within this, several scholars have investigated using digital tools and processes to support the involvement of children in placemaking and create spaces for informal, playful and meaningful opportunities for their participation [24,32,54]. We seek to build on this body of work by drawing attention to the existing gap in children’s involvement in local placemaking processes that HCI can attend to. In doing so, we explore the potential for designing a socio-technical process to engage children in placemaking. We contextualise this inquiry through a collaboration with a local authority, schools and groups of residents involved in an ongoing urban design project, *Streets for People*, in Newcastle, UK.

Working with 54 nine and ten-year-old children in two primary (elementary) schools, we developed an engagement process that comprised three sessions: (1) a digitally supported neighbourhood walk; (2) issue mapping and peer-to-peer discussions using an online engagement platform called Make Place; (3) a ‘Town Hall’ event to open a space for dialogue between the children, residents and the local authority. Our intention behind designing a socio-technical process was to translate the draft proposals emerging from *Streets for People* into a set of scenarios and activities that enabled children to make sense of and meaningfully contribute to the development of the proposals. Through our findings, we explore issues arising from involving children in an ongoing, ‘live’ urban design project and draw implications for the design and deployment of socio-technical processes. This paper offers a unique contribution to the HCI literature through its in-depth reporting and evaluation of an engagement process supported by ICT designed to support a marginalised group in society.

BACKGROUND WORK

Engaging Citizens through ICT

In the UK, local authorities are responsible for regulating the planning and design of urban areas [16]. These practices constitute instrumental facets of *placemaking* – a broader concept emphasising the ongoing process of ‘making’ places through everyday cultural practice, power relations and citizens taking greater ownership of their neighbourhood

This work is licensed under a Creative Commons Attribution International 4.0 License.

CHI 2018, April 21–26, 2018, Montreal, QC, Canada

© 2018 Copyright is held by the owner/author(s).

ACM ISBN 978-1-4503-5620-6/18/04.

<https://doi.org/10.1145/3173574.3173901>

[29,65]. Whilst the value of local authorities engaging citizens in these decisions is championed [16,56], scholars identify a “*democratic deficit*” [53] in instrumental placemaking processes affecting children in particular [10,25,28,42]. Their exclusion presents several challenges, given that children are just as affected by the places and spaces around them as adults, if not more so [19,49]. It also reinforces children’s marginalisation within politics and governance systems [20,53]. Children are often positioned as passive recipients of these decisions through engagement methods that are impenetrable, irrelevant and uninspiring to children (e.g. questionnaires and consultation events) [23,25,30,61]. Such engagement also requires citizens to negotiate complex processes, interpret technical drawings and communicate using technocratic language [22,33,66].

Increasingly, local authorities in the UK are deploying ICT to address this “*democratic deficit*” and mediate their communication in different ways [53,61]. As funding cuts are reducing their capacity to deliver face-to-face services [53], many local authorities are currently implementing strategies that maximise the opportunities offered by ICT to communicate with citizens at distance, e.g. [39]. In doing so, they are also turning to commercial platforms, such as Commonplace [12] and FixMyStreet [38], to deliver broader and deeper civic engagement. However, many local authorities are simply replicating existing ‘offline’ processes through their use of ICT (e.g. by uploading technical drawings online or using online surveys) [5,41,66]. This approach is problematic, as it offers few affordances to young citizens and the increasingly informal and non-hierarchical ways in which they participate in civic life; it also contributes to the false perception that young people are apathetic or incapable of participating in civic processes [5,9,27,35].

Designing Socio-technical Engagement

HCI scholars are increasingly adopting approaches to design that are ‘socio-technical’, through leveraging technology for social ends [14]. Digital civics is an emerging research endeavour related to this that seeks to enable citizens to become active co-agents of change—both in defining problems and taking decisions—through technologies that pursue a more relational civic imaginary [3,41,64]. Several studies in this space assert the legitimacy and capabilities of excluded civic actors in placemaking processes [4]. For example, digital tools and processes have been used to disrupt established power relations in planning processes [15], facilitate informal self-organisation [2], support social movements [13] and scaffold ‘publics’ around urban issues by opening up spaces for advocacy, activism and community-led dialogue [3,18].

Previous work has also investigated how HCI might be able to support children’s engagement in civic life [67,68]; however, there remains a need for this work in specific relation to engagement with civic *processes* such as placemaking. Allied with this, HCI is increasingly recognising the need to ‘dig where they stand’ and recognise

children as “*capable social actors*” [26:224]. An active group within the HCI community, numerous Child-Computer Interaction (ChiCI) studies have involved children both intrinsically and instrumentally in technology design to support their learning and engagement with society [11,21,47,51]. As digital spaces become increasingly fundamental to children’s interpretation of spatiality [34], other studies have problematised children’s vulnerability in these spaces by looking at ways technology can help to protect against risks like cyber bullying [43], privacy infringement [59] and the mixing of child and ‘adult’ behaviours online [50,52].

Case Studies

There have been several examples of HCI studies specifically involving children in placemaking processes. For example, Foth et al. [24] designed engagement activities that involved children physically (through walking) and virtually (using Second Life) appraising a local development site. They found that children brought contextual readings of their local area to the virtual applications (e.g. principles of heritage conservation), bridging the gap between the tangible and the virtual that could discourage the adoption of ICT. Saad-Sulonen and Horelli [54] also involved children in the co-design of a local public space. This engagement also comprised digital and non-digital elements, using an online engagement platform and social media alongside a physical site visit and a face-to-face discussion event. Combined, these activities opened up spaces of dialogue between children and adults, broke down communication barriers and built children’s capacities as active decision-makers. Finally, De Lange and De Waal’s *Face Your World* project involved children in a grassroots collaboration to redesign a local park [32]. Using a 3D simulation platform to envision alternative futures for the park, their work influenced the final design implemented by the local authority and demonstrated children’s potential to contribute to urban design processes.

All of these studies attend to a gap in children’s involvement in urban design processes by leveraging “*youthful styles of working*” [25:366] and creating spaces for informal, playful and meaningful opportunities for participation. They also draw attention to the highly political nature of such processes [8] and the need for HCI researchers to integrate children’s voices through the design of socio-technical engagement that embeds children as “*competent citizens*” [10]. We build on this work by exploring children’s involvement in a ‘live’ and highly political urban design process, and seek to address an ongoing research need at the intersection of scholarly work on placemaking, digital civics and ChiCI.

STREETS FOR PEOPLE

Our study took place in Newcastle, UK. In 2014, the local authority set up the *Streets for People* project to identify where streets could be made more people-friendly by reducing car traffic, improving walking and cycling infrastructure and improving the public realm. The local authority used a variety of statistics to select several neighbourhoods to work in, based on where residents would

be most likely to walk and cycle if this infrastructure was improved. The *Streets for People* project operated in four stages. (1) The local authority recruited councillors and residents to ‘reference groups’ in each neighbourhood to assist in the project’s delivery. (2) The local authority worked with these reference groups to undertake a ‘needs analysis’ in each neighbourhood. Using a commercial online consultation platform, local citizens were asked to share their experiences of streets they found problematic and propose improvements. (3) The reference groups collaborated with urban designers to formulate draft proposals and agree which ideas should be taken forward. (4) These draft proposals would be issued for citywide consultation, to obtain feedback and identify any changes that would be needed before the proposals were finally approved. We came into the project during the project’s third stage, several months before proposals were drafted and issued for consultation. At this stage, we also sought and obtained the local authority’s support for our research intervention.

We worked in two neighbourhoods taking part in the project, one of which was wealthier (and generally more engaged with local authority initiatives) than the other. In preparation for our study, we attended several reference group meetings in these neighbourhoods. Both groups were in the process of drawing up draft proposals that would directly affect children, e.g. creating new footpaths and cycle lanes, closing streets to traffic and creating new play spaces. However, previous attempts to involve children in the project—e.g. by holding a family bike ride to raise awareness of local cycling issues—did not lead to any children taking part in the needs analysis consultation or the reference groups. It was apparent that the local authority had failed to communicate the project in a way that could connect with or appeal to children. If we were to address this, our engagement would have to translate the draft proposals emerging from the reference groups, which were being communicated through technical language and diagrams, into something more meaningful for children. If we were to design against tokenism, we would also have to allow the children to make sense of the streets that were the subject of draft proposals for themselves.

DESIGNING ENGAGEMENT FOR CHILDREN

Our study design centred on the development and deployment of a structured engagement process in two state-operated primary schools, one in each of the neighbourhoods we elected to work in. The school in the wealthier neighbourhood of the two draws in children from across the city, creating a diverse school population. The other operates as a small, local faith school. Drawing on project source material, including proposal documents, maps and technical drawings, and referring to field notes we made during reference group meetings, we designed our process to translate the rationale and draft proposals emerging from *Streets for People* into a set of scenarios and activities to involve local children in the project. In dialogue with local authority officers and the reference groups, we aimed to develop a process that would open spaces for children to

explore potential changes in their neighbourhood and for the insights and outcomes from this to feed directly into the project. We also worked closely with the schoolteachers to design the sessions. They considered our engagement complementary to Citizenship and Geography subjects and likely to generate learning outcomes for both of these, but valuable in its own right, enabling the children to take part in an important local project.

Our process comprised three elements that ran as three sessions in each school. We ran these over the course of two months with gaps of one to three weeks in between, to work within the school timetables. Session 1 centred on a neighbourhood walk, taking in four streets being tackled by *Streets for People* and using a variety of digital and non-digital tools to explore current problems and generate ideas for change. Session 2 involved using an online engagement platform we designed, called Make Place, to map these problems and ideas, upload media they created during the walk and provide peer-to-peer feedback using the built-in discussion tools. Session 3 comprised a one-hour Town Hall event, where the children presented their ideas to the project’s reference groups and local authority officers and initiated an intergenerational discussion about their neighbourhood. We elaborate on each of these below.

Neighbourhood Walk

Based on the reference groups’ ongoing work in each neighbourhood, we designed two different walking routes—one for each school—comprising four stops and lasting around 90 minutes. As we explain below, the children each chose a role and a tool to support their exploration. Each stop entailed a scenario and a set of activities contained on prompt cards that explored *current* problems and *future* changes that could be made to the street. We designed the walk as a way of enabling the children to engage visually and kinaesthetically with the ideas for the street contained in the reference groups’ draft proposals, whilst creating the space for them to identify problems and ideas for change themselves. We framed the purpose of the walk around the children all taking the role of ‘local experts’ who had been tasked with gathering information about the neighbourhood.

The children worked in groups of 5-6, and every child in the group chose an individual ‘expert’ role to adopt for the walk. Each role brought with it different tasks and responsibilities and a different digital or ‘analogue’ (non-digital) tool, all of which we provided, to facilitate their exploration. There were six roles: (1) *explorer*, navigating using a route map; (2) *designer*, drawing using pencil, paper and pavement chalk; (3) *measurer*, using a tape measure; (4) *scribe*, writing responses on the prompt cards; (5) *reporter*, narrating using a stock voice recorder; and (6) *photographer*, using the stock camera application on Android tablets. At each of the four stops, we presented every group with an envelope containing two prompt cards. This detailed a scenario and several activities framed as open-ended questions. The envelopes were colour-coded to match each stop highlighted on the map, direct their focus and build an element of surprise. We

Figure 1: Participants used Make Place to respond to questions about their problems and ideas by placing pins on a map. The system groups pins if there are several in one location (left image). Others using Make Place can view the responses to the questions—written, visual or aural—by clicking on the pins (middle image). Underneath each response are the commenting and emoji functionalities, which participants used to discuss the issues emerging from these responses (right image).

asked the children to use their tools to record their responses to the activities and encouraged them to record any other ideas they had in between stops.

In designing the scenarios, we drew on key issues and ideas being discussed by the reference groups. Our intention was to ground the children's thinking in the context of the street and enable them to explore problems and opportunities beyond the issues that the reference groups were discussing. Whilst we customised the scenarios for the two different walks, both dealt with issues of road safety, cycling infrastructure, greenery and play, as themes that consistently emerged from the needs analysis. We framed the activities around the scenarios to guide their identification of problems and ideas. They followed a repetitive format for each stop: think about the scenario (e.g. 'Shopkeepers are upset because nobody is visiting their shops!'), identify *current* problems in the street (e.g. 'Why might shopkeepers think that this street is quiet?'), and gather ideas for *future* changes (e.g. 'How would you make this place nicer for people to come and shop here?'). We sought to create this very clear distinction to guide the children through the process and more accurately reflect the configuration of the project.

Once back in the classroom, we encouraged the groups to reflect on their responses and elaborate on their favourite idea by making a poster and a short video pitch. They would later have the opportunity to present these, along with the insights gained from the walk, to the reference group and local authority at the Town Hall event.

Make Place

We designed a bespoke online engagement platform, Make Place, and a set of tasks around its use. We designed it to enable children to share the problems and ideas they identified by placing pins on a map corresponding with its location. Its design also builds on commercial engagement platforms used to engage citizens in urban design proposals. Our motivation for designing Make Place was twofold: as a data repository, and as a tool to support discussion. The former would enable the children to aggregate and make sense of their data—the hundreds of written responses,

photos, audio clips, videos and (digitised) drawings generated from the first session—which we could then share with the reference groups and local authority. The latter would enable them to discuss their findings and refine their ideas in anticipation of feeding them into the project.

When placing a pin, the children were asked questions about the placement of their pin – e.g. 'Describe your idea to change something' and 'Is this something that needs to change?' Once placed, these pins were available for other children using the platform to explore and discuss. The pins captured open text as well as images, video and audio, and children responded to pins by writing a comment or selecting an emoji that described their feelings towards the pin. To ensure the platform was a safe space for children, it was designed to simulate but not actually be a public website, with access requiring an administrator password.

The session comprised two tasks: (1), each group uploads their data to Make Place in the form of pins and media; (2) each group responds to others' pins by leaving comments and emojis. We designed the tasks to be completed between 2-4 people on one device (either tablets or PCs) per group and provided instructions through a demonstration. To maintain the clear distinction between *present* and *future*, children placed two different pins, and we encouraged them to create as many pins as they could in the time we gave. In addition, they had access to their photos, audio clips, videos and (digitised) drawings through a secure cloud storage link, all of which they could attach to pins to support their responses. Following this, the groups could explore each other's pins and leave feedback in the form of comments and emojis. To help them, we provided suggestions on Make Place itself of how they might wish to comment.

Town Hall Event

The two Town Hall events (one for each school) centred on a one-hour presentation by the children to members of the local reference group and local authority project officers. We drew inspiration from the format of other Town Hall events, where citizens hold public officials to account on political decisions (in our case, those formulating draft proposals for *Streets for*

People). These events were intended to synthesise the children's engagement in the project and provide them with the opportunity to feed back the problems and ideas they identified face-to-face. We configured the meeting so that children initiated and led the discussion. Each group presented in turn, sharing their insights and referring to the poster they made in the first session. After each presentation, we encouraged adults to ask questions about the children's ideas, and the children to pose questions to the adults that probed how their personal involvement would be reflected through the final *Streets for People* proposals. Following this, we shared insights from Make Place by exploring and discussing pins placed around the map of the neighbourhood.

At the end of the event, we asked the children for feedback on our engagement. This would enable them to reflect on the process, share valuable insights on their use of Make Place and suggest future improvements. To capture this, we gave each child a piece of paper that asked 'What's on your mind?' in a similar vein to a personal social media update.

DATA COLLECTED AND ANALYSIS

Engagement

We carried out our engagement in two primary schools, which we refer to as School A, located in the wealthier area of the city, and School B. In both schools, we worked with mixed ability classes of nine and ten-year-old children. In School A, we worked with 24 children, and in School B, we worked with 30. The activities resulted a corpus of data. During all the sessions, we also took field notes, candid photos and audio recordings to support our analysis.

The children on School A's neighbourhood walk were split into four groups, whilst the children on School B's walk were split into five groups, generating a total of 72 completed prompt cards, 547 photographs, 282 audio clips and 45 drawings across all the groups. Each group also created a poster and a video pitch. In the second session, children from School A worked in smaller groups of 3-4 and accessed Make Place using iPads, which the school regularly give to students for a variety of educational purposes. Children from School B worked in pairs and accessed Make Place using the school's PC room. Our deployments resulted in 115 'problem' pins and 47 'ideas' pins across the two schools. The children also left 277 comments and 365 emojis on pins.

School A's Town Hall event took place during an evening in a local library, at the request of the reference group. At this event, the teacher selected seven class representatives to present their group's ideas to 14 adults, comprising reference group members, teachers, parents and a local authority project officer. At the request of the schoolteachers, School B's Town Hall event took place during the school day in the children's classroom. All 30 children in the group attended this and presented their ideas to one reference group member (a local councillor) and a project officer.

Interviews

In addition to our engagement, we conducted seven interviews with eight key informants at various stages of our

study, all of whom were already familiar with the project and our intervention. The purpose of these interviews was to contextualise our study, obtain insights on the workings of the project and explore how our informants responded to our engagement process. We interviewed two local authority project officers, three teachers with responsibilities for the children, and three reference group members, audio recording and transcribing these with their informed consent.

Analysis

We analysed all the data outlined above to explore how our process was effective in engaging children in the *Streets for People* project and better understand children's positioning within such political and institutional processes. Our analysis consisted of qualitative inductive coding, data organisation and drawing and verifying conclusions [37,44]. We constantly compared between our data sets to ensure our analysis was inductive and well-grounded in the data. In our findings, we draw on the responses to the activities, the pins and comments created on Make Place, and comments made by children and adults during the sessions and our interviews.

FINDINGS

Our findings centre on three main outcomes of our engagement: realising capacities for problem solving and enquiry, opening a space for issue advocacy, and tensions surrounding their influence on the project. Throughout we draw on comments and quotes from children (differentiated by school), local authority project officers (LA), reference group members (RG), teachers (TE) and parents (PA).

Realising Capacities for Problem Solving and Enquiry

Our findings indicate that our process was successful in critically engaging children in a process of problem solving and enquiry. This is the result of the design of our engagement to support children's capacities for urban exploration. Children participating in the neighbourhood walk used the scenarios and activities to make sense of their environment and understand the issues the reference groups were discussing (e.g. a roundabout being dangerous for cyclists). They were then able to use these activities as a springboard for further enquiry about other aspects of the streets we did not present through the scenarios. This led the children to explore issues that were more complex, concealed and mundane. For example, when exploring a scenario about the problems caused by cars on a quiet residential street, several groups from School B questioned the large number of bins blocking the pavement. In doing so, they identified that this prevented people from walking freely and safely on the pavement. Rather than simply blaming those who managed bin collections (the local authority), they instead reflected that residents themselves were also responsible for not taking bins back into their property. Their enquiry led them to propose several physical and community-based solutions, such as creating bin shelters and talking to residents about the need to clear the pavement.

Many children were visiting the streets on the walk for the first time; this led the children to draw on their own experiences and contextual readings of other places, and how

similar problems had been addressed elsewhere. Their ideas for improving a dangerous roundabout, for example, evidence this, with suggestions including traffic lights, installing speed bumps, placing signs to reduce speed and reducing the number of approaches. These are all ‘textbook’ interventions for urban designers and clearly relate to the scale of the problem at hand (as opposed to, for example, tunnelling or wholesale demolition of surrounding buildings). The process of sensitisation the children undertook, through physically experiencing the places they were designing for, thus led them to generate ideas for change that were grounded ‘in-place’—feasible in their scope, appropriately scaled and respectful of physical constraints. However, their enquiry also took them beyond the physical towards the relational, e.g. through their balancing of competing interests presented by the needs of different road users (recognising the need to continue allowing traffic to pass smoothly through a dangerous road junction). This did not mean that their ideas lacked ambition: one group from School B proposed pedestrianising a cul-de-sac, and another from School A proposed beautifying a row of terraced houses by installing a green wall. However, their enquiry remained grounded in the context of the street and in the scope of placemaking processes, and their ideas in what they recognised to be realistic and desirable.

One teacher we interviewed agreed that making it “*real*” was an important quality of the engagement:

“what was good is that they were using their senses and so it was a real thing... they could see, people live here... so I’m not going to build a zoo or a circus” (TE)

Teachers confirmed our engagement introduced the children to the notion that places are both constituted by the physical (buildings and streets) and the relational (people), all of which can be configured in different ways, and that within this configuration there is a “*platform that their voice can be heard*” (TE). This was perhaps unsurprising, given the age of the children and the absence of teaching about placemaking on the school curriculum. However, the teachers thought our process went beyond giving voice: immersing the children in the multisensory experience of being in and exploring the places they were designing for was both a significant contributor to their development of problem solving skills, and to the generation of “*helpful*” (TE), grounded ideas that could potentially be implemented through the *Streets for People* project.

We also found that the ability to select their own roles, each of which came with a different digital or non-digital tool, allowed all the children to mediate their exploration and enquiry in the ways they felt most comfortable. In both schools, most groups used the tablets and audio recorders to create hundreds of digital artefacts to situate their ideas within the street they visited and record their playful exploration of the environment (e.g. using the pavement chalk and the tape measure). They then referred back to these to guide their placement of pins on Make Place, but also for the non-digital tasks of making their poster and during

discussions at the Town Hall events. With the latter, one group in School A were able to support the argument that litter was a problem in their neighbourhood by showing their pins, with their photos attached, to the reference group members and local authority officer at their Town Hall event. Several groups were also strongly guided by the audio they made on the walk in the design of their poster and the identification of numerous problems in support of their main idea. The digital elements thus helped to facilitate their reflection on problems and communication of ideas at distance and convince others of the need for change.

Contrastingly, some groups preferred using pencil, paper and pavement chalk to guide their enquiry. For example, in School A, two of the four groups used the pavement chalk to draw their ideas in-situ. These groups took half or even one third the number of photos that the other groups took, and placed pins on Make Place that displayed these drawings. Similarly, some children enjoyed using Make Place more than others; particularly in School B, some children reported finding Make Place “*tricky*”, “*a little bit hard*”, “*stressful*” and something that they “*struggled*” with. Two possible explanations for this are that some children were less confident using the PCs than their peers were, whilst some children also approached the activity in a more competitive manner than others did. Whilst our findings generally reinforce the value of the digital tools to the children’s exploration of the environment—something that we initially hoped for—they highlight the importance of designing processes that offer a diverse range of digital and non-digital tools to suit different capabilities. A teacher we interviewed confirmed the value of this diversity by noting, “*Some of the sketches were more valuable to the groups than the technology*” and stressing the importance of having a “*real purpose for using the technology*”. Our findings also warn against an overreliance on technology in the design of similar socio-technical engagement processes, and confirm the need for the design of supporting digital platforms to be simple and easy to use, have a clear purpose, and ideally involve a period of prior testing with children (something that our project’s time constraints did not allow).

Opening a Space for Advocacy

We found that our engagement also opened a space for collective advocacy about issues of concern that the children were able to identify on the neighbourhood walk. This contrasts significantly with urban design interventions that seek the approval of citizens for ideas proposed by a developer or a local authority. The walk enabled them to generate a significant body of evidence in support of issues that were important to them but that, importantly, could feed into the work that the reference groups were undertaking. For example, the group from School A that identified problems of litter took several photos as evidence of this to draw attention to a problem they considered pervasive in their neighbourhood and requiring comprehensive remedial action from residents and the local authority. Having gathered this evidence, they placed several ‘problem’ pins on Make Place

drawing attention to this issue: *“We found lots of rubbish and litter behind a fence near the metro”, which “make[s] the place look dirty and messy”*. Another group in School A took a photo of a newly improved pavement with bike racks on their walk, and then used Make Place to place an ‘idea’ pin with this photograph advocating for similarly improved pavements throughout the neighbourhood: *“All pavements should be like the one in the picture”*.

Whilst our scenarios directed their thinking towards particular issues, their ideas were heavily influenced by their own aspirations and normative perceptions of how a place *should* be. For example, groups from School A justified their ideas on Make Place for making a street greener by arguing that their neighbourhood should be more environmentally friendly, have better air quality and be better looked after by residents. Similarly, groups from School B expressed a clear desire to remove enforced restrictions on play – e.g. *“change the street from having no ball games to children playing with anything they want”*, as *“we don’t want to spoil children’s childhood”*. Commonalities between the two schools included encouraging healthier lifestyles—through the implementation of a no smoking zone around a shopping parade (School A), and encouraging walking on weekends (School B)—and improving community cohesion, e.g. *“there could be more benches for the public to sit and socialise”* (School A). Our findings show that the children were using our engagement activities as a platform to advocate clear values that were important to them and persuade others of the need to support their views—e.g. wanting places to be greener, children to be able to enjoy their childhood and the community to be cohesive and friendly. By bringing their own values to their ideation, it reveals a depth of engagement with place that is in stark contrast to what one reference group member thought was an *“unfiltered perspective”* (RG) offered by the children, devoid of rationale or motivation for participation.

Their issue advocacy was not restricted to the walking route either, and the fact that the Make Place map lacked any boundary facilitated the identification of problems and ideas elsewhere in the neighbourhood. For example, one group in School B placed a ‘problem’ pin to note the lack of a car park for the local swimming pool and the consequence of this constraining parking availability at the nearby doctor’s surgery. Another pin even noted how the local supermarket was too expensive. Make Place thus offered the opportunity to go beyond the geographical limitations of the walk, where our time constraints and the size of the area being tackled by *Streets for People* meant we were only able to visit a handful of streets. It also enabled them to explore the neighbourhood and the issues within it in a different way, revealing perspectives that we would not have otherwise obtained. Whilst they did not necessarily delve into the complexities of these issues—e.g. in response to the lack of a car park for the swimming pool, *“Maybe the council could find somewhere where they could park”* (School B)—this suggests the existence of a latent awareness of local urban issues and a

desire to see their neighbourhood improved. This went beyond their own embodied experiences of the neighbourhood, and a clear empathy for others came through in their responses, e.g. decluttering a street for the benefit of residents and creating more room for other children to play.

Whilst the walk facilitated evidence gathering for advocacy around local issues, the use of Make Place went beyond its intended function as a repository for this evidence to serve as a tool to identify issues of importance to the children and present ideas for change, whether they were currently in scope of *Streets for People* or not. In addition, we found that the commenting and emoji selection functionalities enabled the children to deliberate and reflect on their findings and discuss how to implement the ideas they were advocating. Commenting was largely used as a way of expressing agreement (e.g. *“I agree it is very unsafe”*) or disagreement (e.g. *“You can’t have traffic lights in that road”*) with a problem or idea, or probing for further information (e.g. *“Add more detail to how you can improve this”*). In this way, the children used Make Place not only to show support or otherwise for each other’s ideas, but to engage in a collective endeavour of strengthening each other’s ideas and ensuring they had adequate justification for inclusion in the project.

When the children did not have this justification for their ideas, their peers drew attention to this. For example, the fourth stop on School A’s walk involved exploring ways the street outside their school could be turned into a play street. One group in School A agreed that this should be a priority in the project, placing a pin that stated, *“The school playground should have more space”*; this was refuted by another group, who thought they should *“be grateful for the size of our playground, it’s absolutely huge”*, implying that other issues were more important. Similarly, commenters debated whose responsibility it was to implement their ideas: to improve trade at a local shopping parade, one group from School A placed a pin suggesting there should be *“more car parks and bicycle racks [and] the shops should be painted in bright colours”*. An initial comment of support that stated, *“This [is] good, I hope the council does this!”* was rebutted by another group, who believed that *“it’s not the council’s job, it’s for people to do!”*

This issue advocacy was thus not limited to drawing up a *“wish list”* (TE) to present to the reference groups and the local authority for them to implement, as one of the teachers noted was often the case with their school’s Student Council. Instead, the children showed a desire to mobilise others within the class and in the wider community to take action in the form of change in their neighbourhood. For example, one group presenting at School A’s Town Hall meeting argued, *“If people could work together a bit when they’re in their community and make their gardens a bit nicer”*, this would *“[make] it a nicer environment for people to go”*. This desire came through when they were reflecting on the engagement too, e.g. *“We got to have a chance [of] using our ideas to help improve streets... benefitting shop owners to customers to locals”* (School A), and *“I enjoyed making pins... so*

people could be aware and they could change it” (School B). A teacher also confirmed because of our engagement, “They will now be looking for some action” and will be looking for ways they can help initiate change.

Influencing the Project

Notwithstanding this, we found tensions in our data relating to influence and agency of the children taking part, specifically relating to an ambivalence between the extent to which children’s voices were able to influence the project and the extent to which powerful individuals with the reference groups and local authority that could appropriate their voices for instrumental purposes. We designed our engagement so that local children had the opportunity to be included in the *Streets for People* project. Specifically, we set up the Town Hall event, with the children presenting their ideas and leading the discussion, to provide them with a platform to contribute to the shaping of the project in a way that was difficult for the adults to ignore.

At School A’s Town Hall event, we found that the children presented ideas that were driven by an interpretation of *Streets for People* as an opportunity to improve the experience of *being in* the neighbourhood. Three of the four groups presented ideas that proposed better maintenance of gardens, improved shop frontages, and the addition of trees, planters and benches. The other group also brought up issues of litter and the lack of bins, despite their presentation centring on improving safety for cyclists. We had previously observed at reference group meetings that the adults attending the event had considered very few of these ideas before, as they had interpreted *Streets for People* as an opportunity to come up with proposals that facilitated easier movement through the neighbourhood:

“The conclusions that had been drawn prior to the young people’s meeting were all about... cycle lanes and places to park your cycle and pathways and blocking roads... I thought that was really fascinating because nobody had really thought about [what they presented]” (RG)

Reference group members and the local authority officer did not immediately commit to including their ideas in the project; this decision was unlikely to be made during the event in any case. However, we found that the children influenced the adults to rally for their personal ideas and reflect on the approach the reference groups had taken to formulating the draft proposals so far:

“You raise some really important points about the gardens, our remit is just how you get from A to B but... what you say is absolutely right... it certainly made me think more about what Streets for People actually are” (RG)

“Places for people to sit... isn’t anything we’ve included in Streets for People so far, but it would be a lovely direction to go in” (LA)

“I definitely will continue to work with Streets for People to try and bring some of these ideas to fruition” (RG)

The adults in attendance also discussed practical ways of incorporating the ideas that the children presented – e.g. “we might be able to get ward sponsorship from businesses for

plants” (RG), and “could the school not do something with the children... some project [to install a green wall]?” (PA).

After the meeting, one reference group member suggested that the children’s involvement had a disruptive effect on the progress that the groups had made so far: “You’ve definitely threw the cat amongst the pigeons here!” Elaborating on this comment during interview, he thought that having listened to the children’s ideas it would “give the group a little bit of a kick up the backside” (RG), by challenging the group to demonstrate how the *Streets for People* proposals are representing the interests of the whole community going forward. We found similarities between this and School B’s Town Hall Meeting, where their ideas related strongly to similar things. Interviewing the reference group member who attended this meeting, she “was surprised at how many people responded about the litter or the fly tipping or the general look of the place” (RG). Our findings thus suggest a consequence of the children’s involvement as being a strengthening of local accountability of the reference groups, as well as a potential change in direction of the process of drawing up the proposals.

We found that some of our data points more towards a moral obligation, rather than a personal motivation, to act upon the ideas presented by the children. The reference group member who attended School B’s Town Hall event summed this up: “They’re part of the community and they need to be listened to” (RG). Others went further in arguing that now they had contributed towards the project, it would be “unethical to go and ask children what do you think if you don’t pay any attention to what they say” (RG). Given the rarity of children’s involvement in political processes like *Streets for People*, this suggests the very act of involving children thus commands some influence that children have the opportunity to leverage. However, we identified limitations in this obligation that call into question issues of agency in our process to leverage this influence for their own ends, particularly when it came to the children asking what would happen to their ideas at School A’s Town Hall event:

“We’re going to keep your ideas... but we also have to ask lots of other people about what they think... we’ve been working to take people’s problems with getting around in [the neighbourhood] and turn them into good positive ideas... everything that we’ve heard so far makes our ideas better” (LA)

A reference group member also identified the aforementioned moral obligation, but saw it as an opportunity for the reference group themselves to command more influence within the community:

“If the ideas come from the school maybe it would go down better than the residents groups... they might feel more obliged if the kids approach them, it’s hard to say no isn’t it” (RG)

Our data exposes a clear power dynamic between the adults and children in the event that our engagement partially challenged, but did not manage to break down. The suggestion that the children’s involvement would simply serve to enhance the draft proposals formulated by the

reference groups poses broader questions on the limits of participation in political processes, and whether decision-makers' use of citizen generated data is for intrinsic or instrumental purposes. We found further evidence of this at the event, when another group member tried to ask whether the children would support his idea to close an entrance to a playground the children visit often. Asking, "*Would it be convenient to close the gate from [the local playground] to [a local street] and bring all the children to the gate of the little side road?*" (RG) the children presenting simply replied, "No". We interpreted this exchange as an attempt to obtain the support of the children and "*feed the group the answer*" (RG) to strengthen the credibility of his idea. To the reference group member we interviewed, this presented a real danger that in processes such as ours, adults could "*exploit the kids to their own ends*" (RG) to advocate for their own interests. Whilst we wish to avoid any suggestion of malice, our findings point to broader questions around the manipulation of children's voices in political processes for instrumental gain and the risks associated with initiating intergenerational dialogue in engagement processes such as ours. They also reinforce the importance of designing processes that attend to power relations and find ways to support children's ability to influence political processes.

DISCUSSION

We now draw implications for the design and deployment of socio-technical processes involving children by reflecting on the value and limitations of our engagement and suggesting two ways that future work might account for tensions in supporting children's participation in civic processes and balancing ethical challenges within this space.

Engaging Children in Political Processes Through HCI

Society often positions children as vulnerable [1]. By recognising children as "*capable social actors*" [26:224], we challenged this perception through a socio-technical process that granted children the same opportunities to participate afforded to most adults. The process we designed gave precedence to their opinions and mediated their engagement in more "*youthful*" (informal, playful and meaningful) ways [25,66]. The children appeared to find meaning in our engagement, enabling them to re-imagine their locality and in some respect develop ownership of their local streets—the importance of which is highlighted in seminal placemaking research [29]. Similarly, the project's reference groups and the local authority found our engagement's outcomes meaningful too, by opening a space for children voices to be heard and, within this, offering an alternative perspective on the project.

Embodying the argument made by Schusler et al [55] that children can demonstrate their own competence if given the appropriate tools to do so, we positioned the children as 'experts' in their local neighbourhood while supporting "*inquisitiveness*" [17], encouraging them not to take constituent elements of their environment for granted. Despite being a highly structured process, intentionally designed to support focused engagement in a restrictive

educational context, it gave the children free rein to explore the issues in the neighbourhood they found interesting and relevant. In doing so, we created a "*thickly authentic*" experience for the children that speaks to several dimensions of authentic learning identified by Shaffer and Resnick [58]. By engaging the children in a process that tackled "*real-world*" problems and went beyond simply appreciating them, we demonstrated that there is room for children to participate meaningfully in political processes like *Streets for People*. In line with project-based learning approaches, our process also challenged traditional and passive styles of civic education and generated, as one of the teachers put it, "*real*" civic outcomes [6]. Consequently, we wish for our work to serve as a call to HCI researchers to design processes that support the involvement of children in similar 'everyday' political contexts [8]. Yet, what all of this might mean for children to be "*competent citizens*" in political processes [10,62] still remains up for debate.

Through the operational translation of the issues and draft technical proposals emerging from the reference groups, we opened a space for children's involvement in *Streets for People*. Recognising that the proposals and the language used to convey them was illegible, our process of translation seemed to have helped children relate to those issues and proposals leveraging their own, everyday experiences of the world in their own terms [15,36]. Our translation and findings, then, echo other work around data translation that emphasises the importance of making data legible to facilitate sense-making and reflection [3,31] and presenting data in context to make it more meaningful to everyday experience [45]. Beyond just presenting data to children, our process involved them in its production "*in-place*" [60], generating meaningful data bound up with its physical and social context of what was possible on the ground, desirable to local people and feasible for the local authority to implement. Without our work, children would have likely been unaware of the project or the possible scope for their participation. However, we must be aware and account for the ways in which our translation significantly mediated their experience. This raises questions about the accountabilities around HCI's role in civic affairs and in everyday politics that we should examine through future work in this space.

Building on previous research [24,54], our findings also speak of the value of combining digital and non-digital elements within our process. The former facilitated data gathering and sense making to advocate for change, whilst the latter facilitated engagement in political processes 'at the coalface' and ensuring that the reference groups and local authority took their contributions seriously. The tools we designed for the walk facilitated the gradual discovery of the streets and unpicking its constituent parts in granular detail, whilst Make Place created spaces for peer-to-peer reflection and extended discussion. In this sense, the socio-technical process played a role in 'slowing down' the data collection and reflection about their neighbourhood, contrasting with the typical goal of technology design aiming to deliver

efficiency or a ‘speeding up’ of physical interactions [40]. We think future work can explore how ‘slow’ technologies can play a significant role in supporting children’s engagement with placemaking.

While previous work has explored the value of playful engagement in civic spaces such as libraries [68], our study also demonstrated the value of digitally supported roleplay and walks as mediums for children to explore urban issues and participate in transforming their localities. The children were assigned specific responsibilities in their groups, in order to match their preferences and abilities, but also to foster collaboration within the groups. This collaborative element diverges from the highly individualistic configuration of urban design processes facilitated by local authorities [66]. As already identified by Wridt [69:131], engaging children in data collection and analysis in the context of place has yet to be explored in depth. In view of our study, we consider that building on previous work involving citizens in the collaborative generation of data for urban issue advocacy [33] by specifically involving children in this collection and analysis process could represent a novel direction for HCI research.

HCI and ‘Intergenerational’ Dialogue

Our findings demonstrate that there can be value in children and adults working together in digitally mediated spaces to help in city-making [4]. HCI can assist in developing digital spaces and platforms to open spaces of ‘intergenerational’ dialogue between children and adults. However, this raises significant ethical issues entangled with children and adults participating jointly in digital spaces. As already identified, children are at risk of cyber bullying, privacy infringement, abuse or exploitation in such spaces [43,48,52,59], presenting concrete challenges and critical questions that opening up these spaces would raise. We suggest that future work might wish to explore what it would mean to enable children’s participation in digital platforms on a level playing field with adults, whilst simultaneously ‘taking care’ of them and being mindful of the risks posed by opening these spaces for their participation. Building on work that has already highlighted these issues, we call on the HCI community to help develop responses to these emerging ethical conundrums through design.

We recognised the need to act as responsible researchers by accounting for children’s position of vulnerability [1] by obtaining proxy consent for their participation, anonymising their contributions on Make Place and restricting access to the platform involved in the project. However, our findings call into question preconceived notions of what children are ‘able to do’ when processes are more sensitively configured for their *capabilities* [57]. Amartya Sen’s Capabilities Approach notes that the ability to generate valuable outcomes can be ascribed to a combination of personal characteristics and external factors, and is thus not fixed. Similarly, our findings show tensions in the way children’s participation was seen as intrinsically valuable or instrumental to achieve the reference group’s aims [46]. This raises questions on how

we meaningfully incorporate children’s voices in political processes whilst respecting their capabilities to consent and participate. We propose that HCI needs to be attentive in experimenting with the design of spaces for children’s participation in political processes, and sensitive to the different needs and capabilities of children and their different positioning within civil society.

We believe HCI can play a meaningful role in developing spaces for children participation in city-making, yet this work needs to be connected with the existing social infrastructures in the city. In this respect, working with schools on civic projects could increase opportunities to develop methodologies to include children in place-making processes [8]. Here, HCI might assist in the design of toolkits, for example, that allows for the scaling up and replication of socio-technical processes such as ours. Such a toolkit could partially alleviate the resource-intensive nature that doing public work with children (or with any other group) necessarily demands. Building on recent work that involved the collaborative development of a toolkit to support community engagement [4], we propose HCI should work towards developing toolkits geared towards facilitating intergenerational dialogue in placemaking processes.

CONCLUSION

This paper has reported several findings from a socio-technical process developed to engage children in a ‘live’ urban design project. Our study demonstrates the potential for HCI to support the creation of further tools and processes to open up spaces for children’s participation in civic affairs. We suggest toolkits and ‘intergenerational’ platforms as two ways in which HCI can support innovation in this area and create a more level playing field for children with respect to participation in placemaking processes. We suggest HCI researchers can facilitate meaningful connections with civics by working with schools and within ‘live’ political processes such as *Streets for People*. More research is needed to further explore how we can design processes that invite collaborations between children, local authorities and citizens in placemaking and that account for the tensions of opening intergenerational participatory spaces.

ACKNOWLEDGMENTS

We wish to thank the children, teachers, school staff and members of the local community for their participation and support in carrying out this research. This research was funded through the Centre for Doctoral Training in Digital Civics (EP/L016176/1), Digital Economy Research Centre (EP/M023001/1) and MyPLACE (EP/K037366/1), all EPSRC. Data supporting this publication is not openly available due to ethical considerations. Access may be possible under appropriate agreement. Additional metadata record at <http://dx.doi.org/10.17634/154300-68>.

REFERENCES

1. Alissa Antle. 2017. Crazy Like Us: Design for Vulnerable Populations. In *Proceedings of the 2017 Conference on Interaction Design and Children (IDC '17)*, 3–4. <https://doi.org/10.1145/3078072.3078074>

2. Mariam Asad and Christopher A. Le Dantec. 2015. Illegitimate civic participation: supporting community activists on the ground. *Cscw 2015*: 1694–1703. <https://doi.org/10.1145/2675133.2675156>
3. Mariam Asad and Christopher A. Le Dantec. 2017. Tap the Button: A Design-Based Inquiry into Issue Advocacy and Digital Civics. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (CHI '17), 6304–6316. <https://doi.org/10.1145/3025453.3026034>
4. Mariam Asad, Christopher A. Le Dantec, Becky Nielsen, and Kate Diedrick. 2017. Creating a Sociotechnical API: Designing City-Scale Community Engagement. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (CHI '17), 2295–2306. <https://doi.org/10.1145/3025453.3025963>
5. Tom P. Bakker and Claes H. de Vreese. 2011. Good News for the Future? Young People, Internet Use, and Political Participation. *Communication Research* 38, 4: 451–470. <https://doi.org/10.1177/0093650210381738>
6. W. Lance Bennett, Chris Wells, and Allison Rank. 2009. Young citizens and civic learning: two paradigms of citizenship in the digital age. *Citizenship Studies* 13, 2: 105–120. <https://doi.org/10.1080/13621020902731116>
7. Kirsten Boehner and Carl DiSalvo. 2016. Data, Design and Civics: An Exploratory Study of Civic Tech. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16), 2970–2981. <https://doi.org/10.1145/2858036.2858326>
8. Harry C. Boyte. 2004. *Everyday Politics: Reconnecting Citizens and Public Life*. University of Pennsylvania Press.
9. Bart Cammaerts, Michael Bruter, Shakuntala Banaji, Sarah Harrison, and Nick Anstead. 2016. *Youth Participation in Democratic Life: Stories of Hope and Disillusion*. Palgrave Macmillan, Basingstoke, Hampshire.
10. Barry Checkoway, Katie Richards-Schuster, Shakira Abdullah, Margarita Aragon, Evelyn Facio, Lisa Figueroa, Ellen Reddy, Mary Welsh, and Al White. 2003. Young people as competent citizens. *Community Development Journal* 38, 4: 298–309. <https://doi.org/10.1093/cdj/bsg004>
11. Keith Cheverst, Helen Turner, Trien Do, and Dan Fitton. 2017. Supporting the consumption and co-authoring of locative media experiences for a rural village community: design and field trial evaluation of the SHARC2.0 framework. *Multimedia Tools and Applications* 76, 4: 5243–5274. <https://doi.org/10.1007/s11042-016-3515-y>
12. Commonplace. 2017. Commonplace - Online Community Consultation Platform. Retrieved September 19, 2017 from <http://www.commonplace.is>
13. Clara Crivellaro, Rob Comber, John Bowers, Peter C. Wright, and Patrick Olivier. 2014. A Pool of Dreams: Facebook, Politics and the Emergence of a Social Movement. In *Proceedings of the 32nd Annual ACM Conference on Human Factors in Computing Systems* (CHI '14), 3573–3582. <https://doi.org/10.1145/2556288.2557100>
14. Clara Crivellaro, Rob Comber, Martyn Dade-Robertson, Simon J. Bowen, Peter C. Wright, and Patrick Olivier. 2015. Contesting the City: Enacting the Political Through Digitally Supported Urban Walks. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 2853–2862. Retrieved from <https://doi.org/10.1145/2702123.2702176>
15. Clara Crivellaro, Alex Taylor, Vasilis Vlachokyriakos, Rob Comber, Bettina Nissen, and Peter Wright. 2016. Re-Making Places: HCI, “Community Building” and Change. In *CHI'16, May 07-12, 2016, San Jose, CA, USA*, 2958–2969. <https://doi.org/https://doi.org/10.1145/2858036.2858332>
16. Barry Cullingworth, Vincent Nadin, Trevor Hart, Simin Davoudi, John Pendlebury, Geoff Vigar, David Webb, and Tim Townshend. 2014. *Town and Country Planning in the UK*. Routledge, London.
17. Peter Dalsgaard. 2008. Designing for Inquisitive Use. In *Proceedings of the 7th ACM Conference on Designing Interactive Systems* (DIS '08), 21–30. <https://doi.org/10.1145/1394445.1394448>
18. Christopher A Le Dantec and Carl DiSalvo. 2013. Infrastructuring and the formation of publics in participatory design. *Social Studies of Science* 43, 2: 241–264. <https://doi.org/10.1177/0306312712471581>
19. Laurie Day, Liz Sutton, and Jenkins Sarah. 2011. Children and young people’s participation in planning and regeneration: a final report to the Ecorys Research Programme 2010-11.
20. Victoria Derr, Louise Chawla, Mara Mintzer, Debra Flanders Cushing, and Willem Van Vliet. 2013. A City for All Citizens: Integrating Children and Youth from Marginalized Populations into City Planning. *Buildings* 3, 3: 482–505. <https://doi.org/10.3390/buildings3030482>
21. Tawanna Dillahunt, Olga Lyra, Mary L. Barreto, and Evangelos Karapanos. 2017. Reducing children’s psychological distance from climate change via eco-feedback technologies. *International Journal of Child-Computer Interaction* 13, Supplement C: 19–28. <https://doi.org/10.1016/j.ijcci.2017.05.002>
22. Bent Flyvbjerg. 1998. *Rationality and Power: Democracy in Practice*. University of Chicago Press.

23. Marcus Foth. 2011. *From Social Butterfly to Engaged Citizen: Urban Informatics, Social Media, Ubiquitous Computing, and Mobile Technology to Support Citizen Engagement*. MIT Press.
24. Marcus Foth, Bhishna Bajracharya, Ross Brown, and Greg Hearn. 2009. The Second Life of urban planning? Using NeoGeography tools for community engagement. *Journal of Location Based Services* 3, 2: 97–117. <https://doi.org/http://dx.doi.org/10.1080/17489720903150016>
25. Kathryn Frank. 2006. The Potential of Youth Participation in Planning. *Journal of Planning Literature* 20, 4: 351–371. <https://doi.org/10.1177/0885412205286016>
26. Claire Freeman and Paul Tranter. 2012. *Children and their Urban Environment: Changing Worlds*. Routledge.
27. Anita Harris, Johanna Wyn, and Salem Younes. 2010. Beyond apathetic or activist youth: “Ordinary” young people and contemporary forms of participation. *Young* 18, 1: 9–32. <https://doi.org/10.1177/110330880901800103>
28. Roger A. Hart. 2008. Stepping Back from “The Ladder”: Reflections on a Model of Participatory Work with Children. In *Participation and Learning: Perspectives on Education and the Environment, Health and Sustainability*. Springer, Dordrecht, 19–31. https://doi.org/10.1007/978-1-4020-6416-6_2
29. Jane Jacobs. 1961. *The Death and Life of Great American Cities*. Random House, New York.
30. Reinout Kleinhans, Maarten Van Ham, and Jennifer Evans-Cowley. 2015. Using Social Media and Mobile Technologies to Foster Engagement and Self-Organization in Participatory Urban Planning and Neighbourhood Governance. *Planning Practice & Research* 30, 3: 237–247. <https://doi.org/10.1080/02697459.2015.1051320>
31. Lisa Koeman, Vaiva Kalnikaitė, and Yvonne Rogers. 2015. “Everyone Is Talking About It!”: A Distributed Approach to Urban Voting Technology and Visualisations. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI ’15)*, 3127–3136. <https://doi.org/10.1145/2702123.2702263>
32. Michiel de Lange and Martijn de Waal. 2013. Owning the city: New media and citizen engagement in urban design. *First Monday* 18, 11. Retrieved April 21, 2017 from <http://firstmonday.org/ojs/index.php/fm/article/view/4954>
33. Christopher A. Le Dantec, Mariam Asad, Aditi Misra, and Kari E Watkins. 2015. Planning with Crowdsourced Data. *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing - CSCW ’15*: 1717–1727. <https://doi.org/10.1145/2675133.2675212>
34. Laura Lentini and Françoise Decortis. 2010. Space and places: when interacting with and in physical space becomes a meaningful experience. *Personal and Ubiquitous Computing* 14, 5: 407–415. <https://doi.org/10.1007/s00779-009-0267-y>
35. Brian D. Loader, Ariadne Vromen, and Michael A. Xenos. 2014. The networked young citizen: social media, political participation and civic engagement. *Information, Communication & Society* 17, 2: 143–150. <https://doi.org/10.1080/1369118X.2013.871571>
36. John McCarthy and Peter Wright. 2015. *Taking [A]part: The Politics and Aesthetics of Participation in Experience-Centered Design*. MIT Press.
37. Matthew B. Miles and A. Michael Huberman. 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. SAGE.
38. mySociety. FixMyStreet. Retrieved September 19, 2017 from <https://www.fixmystreet.com/>
39. Newcastle City Council. 2015. Digital by Choice: 2015/16 Budget Proposal Integrated Impact Assessment. Retrieved September 19, 2017 from <https://www.newcastle.gov.uk/node/104825>
40. William Odom, Richard Banks, Abigail Durrant, David Kirk, and James Pierce. 2012. Slow Technology: Critical Reflection and Future Directions. In *Proceedings of the Designing Interactive Systems Conference (DIS ’12)*, 816–817. <https://doi.org/10.1145/2317956.2318088>
41. Patrick Olivier and Peter Wright. 2015. Digital civics. *Interactions* 22, 4: 61–63. <https://doi.org/10.1145/2776885>
42. Barry Percy-Smith. 2010. Councils, consultations and community: rethinking the spaces for children and young people’s participation. *Children’s Geographies* 8, 2: 107–122. <https://doi.org/10.1080/14733281003691368>
43. Anthony T. Pinter, Pamela J. Wisniewski, Heng Xu, Mary Beth Rosson, and Jack M. Carroll. 2017. Adolescent Online Safety: Moving Beyond Formative Evaluations to Designing Solutions for the Future. In *Proceedings of the 2017 Conference on Interaction Design and Children (IDC ’17)*, 352–357. <https://doi.org/10.1145/3078072.3079722>
44. Keith F. Punch. 2013. *Introduction to Social Research: Quantitative and Qualitative Approaches*. SAGE.
45. Aare Puusaar, Adrian K. Clear, and Peter Wright. 2017. Enhancing Personal Informatics Through Social Sensemaking. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI ’17)*, 6936–6942. <https://doi.org/10.1145/3025453.3025804>

46. Matt Ratto. 2011. Critical Making: Conceptual and Material Studies in Technology and Social Life. *The Information Society* 27, 4: 252–260. <https://doi.org/10.1080/01972243.2011.583819>
47. Janet C. Read, Daniel Fitton, and Matthew Horton. 2014. Giving Ideas an Equal Chance: Inclusion and Representation in Participatory Design with Children. In *Proceedings of the 2014 Conference on Interaction Design and Children (IDC '14)*, 105–114. <https://doi.org/10.1145/2593968.2593986>
48. Janet C. Read, Matthew Horton, Gavin Sim, Peggy Gregory, Daniel Fitton, and Brendan Cassidy. 2013. CHECK: A Tool to Inform and Encourage Ethical Practice in Participatory Design with Children. In *CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13)*, 187–192. <https://doi.org/10.1145/2468356.2468391>
49. Gwyther Rees, Sabine Andresen, and Jonathan Richard Bradshaw. 2016. *Children's Views on Their Lives and Well-being in 16 Countries : A report on the Children's Worlds survey of children aged eight years old 2013-15*. University of York, York. Retrieved September 19, 2017 from <http://eprints.whiterose.ac.uk/95207/>
50. Karen Renaud and Joseph Maguire. 2015. Regulating Access to Adult Content (with Privacy Preservation). In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems (CHI '15)*, 4019–4028. <https://doi.org/10.1145/2702123.2702456>
51. Dan Richardson, Clara Crivellaro, Ahmed Kharrufa, Kyle Montague, and Patrick Olivier. 2017. Exploring Public Places As Infrastructures for Civic M-Learning. In *Proceedings of the 8th International Conference on Communities and Technologies (C&T '17)*, 222–231. <https://doi.org/10.1145/3083671.3083678>
52. Jennifer A. Rode. 2009. Digital Parenting: Designing Children's Safety. In *Proceedings of the 23rd British HCI Group Annual Conference on People and Computers: Celebrating People and Technology (BCS-HCI '09)*, 244–251. Retrieved September 19, 2017 from <http://dl.acm.org/citation.cfm?id=1671011.1671041>
53. Yvonne Rydin. 2015. *Five Radical Ideas for a Better Planning System*. University College London, London. Retrieved September 19, 2017 from <https://www.ucl.ac.uk/bartlett/planning/research/five-radical-ideas-better-planning-system>
54. Joanna Catherine Saad-Sulonen and Liisa Horelli. 2010. The value of Community Informatics to participatory urban planning and design: a case-study in Helsinki. *The Journal of Community Informatics* 6, 2: 1–22.
55. Tania M. Schusler, Marianne E. Krasny, Scott J. Peters, and Daniel J. Decker. 2009. Developing citizens and communities through youth environmental action. *Environmental Education Research* 15, 1: 111–127. <https://doi.org/10.1080/13504620802710581>
56. E. Seltzer and D. Mahmoudi. 2013. Citizen Participation, Open Innovation, and Crowdsourcing: Challenges and Opportunities for Planning. *Journal of Planning Literature* 28, 1: 3–18. <https://doi.org/10.1177/0885412212469112>
57. Amartya Sen. 1992. *Inequality Reexamined*. Clarendon Press, Oxford.
58. David Williamson Shaffer and Mitchel Resnick. 1999. “Thick” Authenticity: New Media and Authentic Learning. *Journal of Interactive Learning Research* 10, 2: 195.
59. Cristiana S. Silva, Glívia A.R. Barbosa, Ismael S. Silva, Tatiane S. Silva, Fernando Mourão, and Flávio Coutinho. 2017. Privacy for Children and Teenagers on Social Networks from a Usability Perspective: A Case Study on Facebook. In *Proceedings of the 2017 ACM on Web Science Conference (WebSci '17)*, 63–71. <https://doi.org/10.1145/3091478.3091479>
60. Alex S. Taylor, Siân Lindley, Tim Regan, David Sweeney, Vasillis Vlachokyriakos, Lillie Grainger, and Jessica Lingel. 2015. Data-in-Place: Thinking through the Relations Between Data and Community. 2863–2872. <https://doi.org/10.1145/2702123.2702558>
61. Mark Tewdwr-Jones, John Goddard, and Paul Cowie. 2015. *Newcastle City Futures 2065 Report*. Newcastle Institute for Social Renewal, Newcastle University, Newcastle upon Tyne. Retrieved September 19, 2017 from <http://www.newcastlecityfutures.org/wp-content/uploads/2016/11/NewcastleCityFutures2065Report.pdf>
62. Kay E. M. Tisdall. 2008. Is the Honeymoon Over? Children and Young People's Participation in Public Decision-Making. *The International Journal of Children's Rights* 16, 3: 419–429. <https://doi.org/10.1163/157181808X311240>
63. John Vines, Rachel Clarke, Peter Wright, John McCarthy, and Patrick Olivier. 2013. Configuring participation: on how we involve people in design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*, 429–438. <https://doi.org/10.1145/2470654.2470716>
64. Vasilis Vlachokyriakos, Clara Crivellaro, Christopher A. Le Dantec, Eric Gordon, Pete Wright, and Patrick Olivier. 2016. Digital Civics: Citizen Empowerment With and Through Technology. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '16)*, 1096–1099. <https://doi.org/10.1145/2851581.2886436>
65. William Hollingsworth Whyte. 1980. *The Social Life of Small Urban Spaces*. Project for Public Spaces.
66. Alexander Wilson, Mark Tewdwr-Jones, and Rob Comber. 2017. Urban planning, public participation and digital technology: App development as a method of generating citizen involvement in local planning

- processes. *Environment and Planning B: Urban Analytics and City Science*: 239980831771251. <https://doi.org/10.1177/2399808317712515>
67. Jill Palzkill Woelfer and David G. Hendry. 2010. Homeless Young People's Experiences with Information Systems: Life and Work in a Community Technology Center. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '10), 1291–1300. <https://doi.org/10.1145/1753326.1753520>
 68. Gavin Wood, John Vines, Madeline Balaam, Nick Taylor, Thomas Smith, Clara Crivellaro, Juliana Mensah, Helen Limon, John Challis, Linda Anderson, Adam Clarke, and Peter C. Wright. 2014. The Department of Hidden Stories: Playful Digital Storytelling for Children in a Public Library. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '14), 1885–1894. <https://doi.org/10.1145/2556288.2557034>
 69. Pamela Wridt. 2010. A Qualitative GIS Approach to Mapping Urban Neighborhoods with Children to Promote Physical Activity and Child-Friendly Community Planning. *Environment and Planning B: Planning and Design* 37, 1: 129–147. <https://doi.org/10.1068/b35002>