So you’re literally taking the piss?! Critically analysing and accounting for ethics (and risk) in interdisciplinary research on children and plastics

Kraftl, Peter; Lynch, Iseult; Jarman, Polly; Menzel, Alice; Walker, Amy; Till, Ruth; Hadfield-Hill, Sophie

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Title

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Prologue: taking the piss – ethically

During the ethical review process for this project at our University, the ethics committee raised a question about the transport of urine samples we were taking from students. We had planned that students would be trained in taking their own urine samples – a simple process – and would take sample pots home. We thought this would enable greater privacy, comfort and time for the students. They would then bring the samples back to school, handing them to the researchers.

However, the ethics committee strongly recommended we reconsider this approach. They were concerned that there was potential for embarrassment to students (for instance, samples being opened on the school playground). They asked whether the school would be willing to deal with managing these risks, and how we would manage them.

In response – and after careful discussion with the school – we decided to ask the students to take samples at school, but during the project's workshop sessions. We felt that – since the rest of the school would be in lessons – this would ensure appropriate time and privacy, whilst avoiding issues around transportation. Although this was not a 'perfect' solution, we were able to collect the samples without any (major) hitches.

Introduction

The starting point for this paper is a series of juxtapositions. One is between the careful, deliberate and lengthy discussion about the urine samples summarised in the Prologue, and the comment from a social-science colleague (which inspired the title of this paper) that, in this project, we were *literally taking the piss*. Although that colleague was joking, and although they were supportive of the project, this comment highlights something of the preconceptions that social scientists – and especially those working with children – have of (bio)scientific research methods. A second juxtaposition, which we explore in more detail below, is between the increasing perception of ethics committees as intrusive, prohibitive, anti-litigious instruments of neoliberal Universities and what – in our experience – we found to be an often engaged, detailed, careful, caring, critical-but-constructive attitude to supporting our research. A third juxtaposition is between the relative levels of confidence, comfort and (un)ease with which we as researchers from different disciplines were able to navigate the conduct of a research project involving methods as diverse as urine samples, semi-structured interviews, and a bespoke mobile phone app.

This paper, then, is about the ethics of interdisciplinary research with children. It is based upon an eighteen-month, multi-method research project that aimed to critically analyse the entanglements of children with plastics, and which sought, for the first time, to bring together methods from across the social sciences, the environmental (nano)sciences, and the arts in

childhood research. In terms of children's geographies and childhood studies literatures, it sits at the confluence of increased interest in interdisciplinary research methods, and intensifying engagement with post- forms of thinking and doing research – post-qualitative, post-human, post-child (e.g. Hackett and Rautio, 2019; Aitken, 2018a). However, whilst there has been significant headway in developing commonworld ethics that account for the entangled responsibilities of humans and our companion species (Taylor and Pacini-Ketchabaw, 2018), there has been little detailed reflection on how these interface with more procedural questions of research ethics. Moreover, it remains the case that even within post-qualitative and/or mixed-methods studies, 'interdisciplinarity' still overwhelmingly means collaboration between scholars working largely within *social-scientific* disciplines concerned with children. Where that is not the case, interdisciplinary childhood studies scholarship means partnering either with those who share some methodological-epistemological affiliation (for instance, historians or, occasionally, psychologists), or (in the case of research on children's health) with 'non'-social-scientists who specialise in research with children.

Indicative of the above trends is that, in the very few examples of papers about the *ethics* of 'interdisciplinary' research with children (e.g. Hopkins and Bell, 2008) or, indeed, 'interdisciplinary' research of any kind (e.g. Parks and Morgan, 2019), it transpires that virtually all of the disciplines concerned are either from or closely-related to the social sciences. It is not the intention of this paper to instantiate any false divide between the 'social sciences' and their outsides. Nevertheless, a key question that this paper addresses is: what are the ethical issues involved in research that brings together social scientists with scholars working in fields that are more distant from the social sciences, and which rarely, if ever, do *any* research with *children*?

Consequently, this paper's contributions are three-fold. First, it provides detailed reflections, provocations and suggestions as to what kinds of research ethics might be appropriate in the context of burgeoning posthumanist, new materialist, commonworlds approaches to childhood. As per Kraftl (2020), and thinking on from these approaches, we term these ways of thinking and doing *after childhood*. Second, it constitutes the first attempt to consider the ethics of what might be termed more 'radical' interdisciplinary childhood research – those forms of interdisciplinary collaboration covered by the question at the end of the last paragraph. Third, in light of what transpires to be an absence (when compared with conceptual or methodological matters) of systematic reflection on the research *ethics* entailed in *any* kinds of research involving more 'distant' disciplines, this paper also offers key considerations for researchers wishing to engage in these kinds of research beyond childhood studies. Given the ways in which geographers, and others, have (been compelled to) become engaged with *interdisciplinary* research on 'grand' or 'global' challenges, a focus on the ethics of such endeavours is timely.

After a critical review of literatures on research ethics, childhood studies and/or interdisciplinarity, the paper outlines the research project on plastics and childhoods. We then use a series of vignettes recalling different stages of the research process, written by one or more of the research team. Hence, the paper offers a set of detailed considerations that cover issues including research ethics committee review, biological sampling risk assessments,

taking samples (and talking about taking samples), data analysis (and talking about 'results'), and using an app. The conclusion offers a more formalised – although not intentionally programmatic – framework that may inform future research.

On the ethics of (interdisciplinary) research with children, after childhood

As the Editorial of this special issue indicates, detailed reflection upon research ethics is not new for children's geographers or childhood studies scholars (e.g. Prout and Christensen, 2002; Hopkins and Bell, 2008; Morrow, 2008). It is therefore not our intention to review all of this work (see Powell et al., 2012; Abebe and Bessell, 2014). Rather, this section focuses on two more specific areas of scholarship that are particularly relevant to this paper: the ethics of mixed, participatory, creative methods and the continued figure of the individuated rights-bearing child; and, the ways in which research 'after' childhood has sought to critique such notions of rights and agency, but has remained limited both in terms of the scope of interdisciplinary work and ethical reflection.

In recent years, childhood researchers have augmented more established reflections on research ethics in light of considerable interest in mixed, participatory, digital and/or creative methods (e.g. Bradbury-Jones and Taylor, 2015). A key concern has been with the relative role of the researcher– whether an adult 'academic' or a young 'peer' – as a fleshy, emotive participant in the research process. For instance, Atkinson (2019) advocates nuancing Mandell's (1988) classic notion of the 'least-adult role' towards the notion of the 'honorary child', where adults are still viewed *as* adults but with the possibility of inclusion into (shifting, ephemeral) childhoods, on children's terms. Meanwhile, Mayes (2015) reflects on moments in a peer-research project that used puppetry performances when older young people – as peer researchers – themselves theorised their own 'becoming-child' in ways that extended capacities for fostering children's 'voice'.

In terms of visual or digital techniques, questions of research ethics must move with the very media with which they are concerned. For instance, both require a re-evaluation of notions of privacy and anonymity, particularly when there can be no absolute guarantees about data security, and when privacy needs to be balanced with children's (and parents'/carers') right to be visible (Canosa et al., 2018; Ergler et al., 2016). Whilst these issues might often be technical, they spill over into wider questions about research conduct and, especially, the interplay of 'mess', 'accident' and 'failure' (Horton, 2008; Harrowell et al., 2018; Gillett-Swan and Sargeant, 2018) with ethics of care in research (Saunders, 2019).

All of the above are important reflections for childhood research. Indeed, they resonate with some of the vignettes below – from the presentation of our different levels of 'expertise', to the inclusion of technologies including (but also extending beyond) the digital. However, notwithstanding continued calls for more relational, situated forms of ethical conduct, there are now significant tensions and critical discussions around notions of individuated rights that still largely undergird these calls. In turn, though, notions of rights are highly context-specific. For instance, Ahsan (2009) and Beazley et al. (2009) point out that in countries such as Bangladesh and Malawi, the right to be 'properly' researched is still a pressing need for

many vulnerable children. However, as Ahsan (2009) also points out – and as Aitken (2018b) argues in more depth – the UNCRC's version of individual rights, which underpins the vast majority of the work cited above, is often not (wholly) appropriate where more relational forms of rights suit local contexts.

Despite these relational critiques of the notion of individuated rights, discussion about ethical conduct in research with children remains resolutely human-centred. However, there has been burgeoning interest in ways of thinking and doing childhood research, *after childhood* (Kraftl, 2020). Alongside a range of work on the ethics of childhood and interdisciplinary research – this scholarship is *part* of the framing for this paper. These approaches – diverse in themselves – call in part for ways to *decentre* children, and many established notions of children's rights, in conducting more-than-human childhood studies (Taylor et al., 2012; Spyrou, 2018; Hackett and Rautio, 2019). Thus, for instance, new materialist, nonrepresentational and posthumanist approaches have in different ways called for an attention to how children's lives are entangled with animal companion species and all manner of material objects (for further details, see Aitken, 2018a; Horton and Kraftl, 2018; Taylor and Pacini-Ketchabaw, 2018; Land et al., 2019).

As Kraftl (2020) argues, however, these approaches could not merely extend *beyond* or decentre children from analysis, but offer ways to bring them in and out of *focus* in perhaps more radically interdisciplinary ways. Thinking and researching 'after' childhood might, on the one hand, mean an attunement to the kinds of temporalities (those exceeding human generations) and materialities (those evading ordinary forms of human proprioception because of their extremely small or large size) that childhood studies has either not wished or not been able to witness thus far. These are – chronologically and conceptually – 'after' even those forms of more-than-human entanglements that new materialist and posthumanist scholars of childhood have sought to witness. On the other hand, as Kraftl (2020) notes, the term 'after' denotes something more modest, something beneath or behind what (for instance) childhood scholars or advocates think matters most. It refers to a sense of those concerns or processes that go under the radar or which traditional phenomenological methods, including those of many new materialist scholars, have no adequate way to grasp (on their own). Whilst there is a vague sense that plastics matter (to children), rather than a focus on their feelings about or interactions with obvious 'objects', such as plastic toys, this paper considers an approach that sought to witness micro- and nano-scopic particles of plastics and metals. The fact that these particles circulate globally and may persist *after* humans are long gone is a case in point. However, as outlined below, it is also the case that – despite a sense of modesty – more radical, interdisciplinary approaches (*after* even those of new materialist and posthumanist scholars) are required to afford even a sense of these kinds of circulation.

At a glance, such moves may seem to be contradictory to efforts to assert children's right to be researched 'properly' – especially where that right has not been established – yet they may not be (Beazley et al., 2009). As Taylor and Pacini-Ketchabaw (2018) point out so powerfully, a focus on the entangled rights, responsibilities and ethics of care that co-implicate children with companion species might require a generous, situated and relational

sense of ethics that can complicate, complement and extend (as well as critique) notions of individuated rights. In other words, research 'after childhood' requires an ethical attunement to the complex, apparently intractable challenges that children face in their lives. As Kraftl (2020) argues, these *include*, but extend beyond (or *after*), the forms of marginalisation, institutionalisation and violence writ by adults upon children, intersecting with climatic and ecosystems changes, resource injustices, technological advances, health and illness, all articulating in different ways with social, economic and geographical differences (Nxumalo and Pacini-Ketchabaw, 2017). In this paper, as the vignettes show, these also extend to the very doing of research with multiple human and nonhuman actors and processes: (again) modest, slow, considered ethics of care and collaboration

There is not space to fully review the diverse nonrepresentational, new materialist and posthuman approaches to childhood that have emerged in recent years. However, when it comes to *ethics*, three points stand out. First, that thinking and doing after childhood requires new forms of attunement: of thinking-with, walking-with (etcetera) children *and* the more-than-humans with which they live. For Land et al. (2019), this requires crafting new forms of connection, new ways of telling place-stories, and new ways of weaving together encounters and senses of responsibility across distance (in their case, through Facetime). For Millei and Rautio (2017), nonrepresentational engagements with children require critical reflection on the temporalities of research: questioning the linear production of knowledge and slowing down, witnessing banal 'overspills' beyond what traditionally 'matters' during conventional data collection and analysis.

Second, whilst there are clear ethical implications for eco-social justice and methodology, the precise implications for procedural questions of research ethics have been less clearly articulated. This is partly because post-qualitative research practices imply a questioning of procedural ethics but, as this paper demonstrates, ethical issues may still arise in research that almost entirely 'decentres' children, and in ways that loop back to the apparently institutionalised and detached (and 'human') concerns of ethics committees. Third – and this critique is meant gently and generatively – given the particular kinds of inter-/post-disciplinarity engaged through (for instance) commonworlds frames, the particular ethical concerns arising through collaboration with (especially) *scientists* remain un-explored. In a wider, ethical sense this is a key lacuna. Although not to be understood as 'the answer' to the kinds of intractable challenges noted above, it nevertheless seems vital to *try* to engage more diverse, if not radical, interdisciplinary constellations of scholars in critical, careful responses to such challenges and efforts to find *other* considered ways of witnessing the more-than-human entanglements in which children are caught up (see Kraftl, 2020, for further discussion).

In this paper, the above challenges are taken up in a three-fold manner: via the substantive focus on plastics and their multiple material, affective, political and performative entanglements with children's bodies and environments; via the research methodology (detailed below), which sought to witness these entanglements through diverse, multidisciplinary methods including digital apps, social media analyses, artistic workshops and biosampling; and via reflections in the vignettes upon the deliberations and practices that

surrounded or were prompted by more-than-human stuff – from biosampling technologies to the (non)presence of plastics and a range of elements.

Finally, we expand a little more on a point made earlier about reflection on the ethics of *interdisciplinary* scholarship. As far as children's geographies and childhood studies are concerned, the few publications that do claim a focus on inter-/post-disciplinarity seem to use the term as a bit of a black box descriptor, without detailing the challenges, tensions or opportunities that arose *because of* a particular mix of disciplines (Hopkins and Bell, 2008; Canosa et al., 2018). There is a sense of interdisciplinarity-already-achieved; research projects and teams have a feeling of internal coherence, whilst the problems, tensions and challenges that are discussed are those that arise in the interaction of the teams with research participants. This is not intended as an attack on those particular publications; rather, it is indicative of a manoeuvre found throughout the social sciences where the '*interdisciplinarity*' of a project ends up being quite incidental to the ethical issues at hand (e.g. Parks and Morgan, 2019).

Perhaps the only area where social scientists – of childhood and, mainly, beyond – have reflected on interdisciplinary research ethics is as part of an appraisal of the roles, identities and methods of (especially) social science researchers taking part in medical research (Eakin, 2016). For instance, Hoeyer et al. (2005) examine conflicting ethical assumptions of social scientists and medical researchers, focusing on (admittedly familiar) issues such as perceptions of participants, informed consent and data property rights. Elsewhere, there is analysis of social scientists as 'outsiders' in medical research – either in attempts to gain 'legitimacy' or 'adapt' to medical research cultures (Albert et al., 2015) or, as in an innovative paper in this journal by Wilkinson and Wilkinson (2019), in negotiating and critiquing the sometimes frustrating, sometimes bizarrely light-touch, ethical review procedures of the UK's National Health Service. Of these papers, only the last – a study of children awaiting hair transplants – explicitly involves children; indeed, childhood studies scholars working in medical research, especially in the UK, would gain important insights from this work. However, whilst drawing on their work, it is also important to remember that interdisciplinary scholarship can take many forms, and can also have many foci, beyond health and medicine. With this final observation in mind, we next introduce the research project upon which this paper is based.

Methodology: researching children, plastics, and more besides

This paper reflects on an eighteen-month project that sought to explore and question how plastics are entangled with childhoods. Set in the context of mounting concern about the environmental legacies of plastics (e.g. Davis, 2015; Ghosh, 2019), the project nevertheless set out to generate a non-judgmental analysis of the multiple 'faces' of plastic, given its capacities to both destroy *and* support (human) life. The project also developed a range of ways for thinking and doing, after childhood. Methodologically, and inspired by queer theories of materiality, this meant deploying creative, eclectic and speculative ways to enact diverse 'cuts' through childhoods and plastics, scavenging and juxtaposing forms of 'data' rarely placed alongside one another (e.g. Liboiron, 2016; Haraway, 2011; Halberstam, 2005).

The intention was always to *start with* plastics and childhoods, but to allow them to weave in and out of focus, to assess them together and apart (i.e. as not always-readily related in fixed ways, or as stable categories in themselves), and to find quirky contact zones where plastics and childhoods encountered one another, however briefly (Land et al., 2019).

Although the project also involved a significant digital media component (see Author a), this paper concentrates on a programme of intensive work undertaken at a secondary school (for 11-18 year-olds) proximate to the authors' institution. This work involved a wide cast list. Alongside the students themselves, artists and graphic designers, the research ethics committee, a research advisory group at the school, environmental scientists and laboratory analysts all contributed. The list below provides some brief detail on the roles of the team members who are authors of this paper.

Peter: a children's geographer, and the project lead

Iseult: an environmental nanoscientist with expertise in the analysis, manufacture and regulation of nanomaterials, lead for the biosample collection and analysis, and involved in the project's design

Polly: a children's geographer, and a researcher for the project

Alice: a geographer working on (expectant) parenting, and a researcher for the project

Amy: a geographer working on children and families, and a researcher for the project

Ruth: at the time of the research, a geography teacher, and the lead for the research at the school

Sophie: a children's geographer, particularly involved in the project's design

The research was couched within a series of weekly workshops, co-designed by the research team (see Author, a). All students opted into the research, choosing our project amongst various options for 'enrichment' sessions on Friday afternoons. Following the introductory sessions, students and their parents/carers gave informed consent, with different proformas for the different methods (meaning that students could, and did, opt only to take part in some activities). Thirteen students participated, aged 11-15 (eight boys, five girls).

Initially, the workshops focused on students' knowledge about plastics, with activities ranging from discussions about plastics' environmental effects to hands-on activities such as (one of our favourites) attempting to break plastic bottles using only their hands. Unsurprisingly, since the students had chosen to take part, they were already knowledgeable about plastics, and their environmental impacts. We then introduced several other components. First, a bespoke mobile phone app, which enabled students to take photographs and enter text about plastics they encountered (crudely split into categories 'water', 'food' and 'leisure'). Second, a follow-up semi-structured interview, where students placed photos from the app onto a large sheet of paper, alongside a city map, to generate richer narratives about the plastics they had encountered. Third, we trained the students to take biosamples – of soil, water, urine and breath for the purpose of identifying nanoparticles. They took soil and water samples at home, but, as indicated in the Prologue, urine and breath samples were conducted at school. These were tested in the laboratory for plastics (or their chemical

signatures such as additives) alongside various other elements (such as aluminium, titanium, boron and zirconium). As becomes evident below, we presented initial findings from the tests during workshops, using these as discussion to explore the multifarious (largely invisible) material stuff that passes into, through, around and out of our bodies and environments – not just plastics. Noteworthy here is that at no stage did we investigate the health effects of plastics or these other elements, nor draw any hypothetical conclusions, other than reassuring the students that the levels we found were (apart from one scare, discussed below) within safe limits.

Finally, the research concluded with a workshop in which we attempted to unsettle the students' knowledges of and feelings about plastics by working with some artists to create some sculptures out of scavenged plastic materials. For reasons of space – and to focus on the more 'radical' elements of our interdisciplinary collaboration – we cannot include reflections on that work here. Thus, the rest of this paper is structured around vignettes that recount some of the ethical issues, moments, material entanglements and concerns that emerged during the workshops involving the biosampling and, to an extent, the mobile phone app. It is more-or-less chronological, beginning with the process of gaining institutional approval through ethics and risk assessment processes. The vignettes are accompanied by some fairly brief analytical points and questions designed both to inform and provoke further debate about the ethics of a project like this.

Plastic ethics: vignettes from the research

Peter and Iseult

*Potentially the first of its kind, this project was a pilot study and our first (ethical) consideration was to choose biosamples that we **expected** to be easier to get ethical approval for – specifically non-invasive sampling, and low levels of cellular material in healthy individuals. This links also to the ethical question of identifying any underlying diseases amongst children via a risk assessment – if they had had lung problems, the breadth condensate would not have been a suitable sampling method. Similarly, individuals with bladder or kidney problems would be less suitable for urine collection, as they may have larger amounts of cells in the urine. Thus, although these biofluids were not the optimal ones in terms of likelihood to detect plastics (stool would have been best for that, with blood a good second) or other air pollution particles (saliva, sputum or blood), they enabled us to take an important (and ethical) first step in doing this kind of research with children.*

The process of gaining institutional ethical approval took nine months. Initially, this took the form of an Application for Ethical Review (AER) – a detailed proforma running to over 5,000 words, with nine appendices including copies of interview questions and consent forms. Many parts of the form – on participant recruitment, consent, reward, etcetera – were familiar to the social scientists on the team. However, others were not. For instance, as well as asking about the transport of urine samples, the ethics committee asked for other key information:

- *confirming whether we would be taking biofluid samples from children under 16, and, if so, providing a simpler information sheet;*

- *providing a risk assessment, approved by a departmental health and safety officer, for the biosampling including collection, sterilisation, storage, and disposal;*
- *outlining in more detail how breath and urine samples would be taken, where and when;*
- *providing written information to participants on how samples should be taken, stored and transported;*
- *confirming that all samples would be rendered acellular within seven days via sterilisation*[i]*;*
- *clarifying why we were asking whether participants had any underlying health conditions and if identification thereof would mean exclusion from the project.*

At face value, many of these comments resonate with the experiences of other social scientists who have had to adapt to medical (or other lab-based scientific) research protocols (Albert et al., 2015). Indeed, although in a very different context, for the children's geographers on the team, this meant learning some of the practicalities, languages and technologies associated with biosampling, rather than explicating how social-scientific ethical standards did (or did not) correlate with a form (compare Wilkinson and Wilkinson, 2019).

However, there were three key differences, which lead to three key ethical considerations. First, this was not medical research, and the risk assessment form asked questions pertaining to the ethical conduct of research, but not in relation to the '*social science*' elements of data collection. For instance, the form asked about the following (*our responses in brackets*). What stands out is a rather different set of considerations for not only mitigating harm (e.g. Beazley et al., 2009) but actively ensuring the wellbeing of all human participants (*including* the researchers) and the environment – an ethic of care that extends fairly dispassionately and readily across more-than-human worlds (compare Taylor and Pacini-Ketchabaw, 2018).

- *Training and Assessment of Competence ("The postdoctoral researchers will be given training in safe handling and disposal of human biological samples (GUIDANCE/26/WHBFT/14), and in data management issues related to personal data").*
- *Likelihood of Infective Risks to Laboratory Workers and Participants ("Minimal. As we are not interested in the biological content of the samples, they will be autoclaved prior to analysis to remove any biological activity. Autoclave could be brought to the school for sterilisation of samples prior to their transport to [university lab] if that was the preferred option. Minimal risk of infection – gloves and standard lab chemical/biological PPE will be we worn by postdocs and staff handing the samples. Children will be provided with gloves during sampling")*
- *Are any of the work procedures likely to produce aerosols? If so, should the work take place in a safety cabinet? ("The breadth condensate samples are aerosols, but are collected directly into sterile tubes and cooled immediately [leading to condensation back to liquid]. All handling of samples is thus in liquid phase")*
- *Sterilisation and disposal ("Post-autoclaved samples, and samples from ICP-MS and other analytical approaches will then be disposed of as chemical waste")*

Second, the process did not simply entail Peter (as a social scientist) filling out a risk assessment that was unfamiliar to him. Rather, thanks to the interdisciplinary nature of the team, this was a collective endeavour. In fact, Iseult actually completed the form since she had the expertise – but only after detailed conversations (that included the school and the school's research advisory group) about the project's conduct, and with our ethics committee about the transport of urine samples. Although there was some to-ing and fro-ing between the departmental health and safety officer and ourselves, what was particularly interesting to us was that neither the inclusion, nor the competence, of *children* – and children as *researchers* – was questioned, thanks to the open, detailed and collaborative way in which we completed the risk assessment form.

Third, the whole process – taking around four times longer than ethical approval for 'straight' social science projects – was frustrating, and the constant requests for additional information and clarification grating. We are therefore not claiming that our approach was perfect, or smooth. However, in hindsight, it *felt* caring, constructive and collaborative and, as intimated above, this sense extended to working with the institution's ethical committee. Certainly, some of the clarifications that were requested would *also* have been made to protect the university from litigation (Dixon-Woods et al., 2007); and, arguably, some of the questions seemed redolent of what Guta et al. (2013: 301) term 'ethics creep', since they appeared somewhat tangential to ethical research conduct. Nonetheless, although fairly obvious, we nevertheless want to foreground that: our ethics committee includes research-active academics who give voluntarily of their time to provide detailed comments on lengthy forms; requests for additional information were as much to provide context on what was a novel research project, but which in principle the committee were keen to support; that, as a result, it felt overwhelmingly as if their comments were designed to *improve* the research rather than prevent any element from happening (they did not); and that the professional services staff leading the review process were courteous, well-informed, collegiate and supportive.

Perhaps this experience is unusual. Perhaps we look back on it positively because the ethics application was approved and the research was, on-the-whole, successful. Or, perhaps – and this is intended as a provocation – we as childhood studies scholars might like to both attenuate our sense of being the 'experts' when it comes to the ethics of (especially interdisciplinary) research with children, and to recognise and value the often caring, ethically-oriented, constructive, but largely-hidden work and expertise of ethics committees. Moreover, we also recognise that the care and collegiality of the whole process emerged in large part as a result of the *time* it took – a rather different case for 'slowness' in research (compare Millei and Rautio, 2017; Wilkinson and Wilkinson, 2019).

Ruth and Polly

***Ruth**: The consent form provided students and parent(s)/carer(s) with clear, detailed information about the research and the different methodologies. It was really helpful that students felt confident that they had the autonomy to choose which aspects of the research they wanted to participate in by having to consent to each methodology. The researchers created an inclusive space by welcoming students to still attend the sessions even if they were*

not taking part in specific aspects. When original consent forms were returned many students did not feel confident with participating in the biosamples tests and did not give consent.

Polly: *'Can we find out about our test results? What if you find some bad diseases in our bodies?' As we introduce the concept of the breath and urine sampling, participants fire questions at us. Many are concerned with what the results might indicate about metals and plastics found in their bodies. 'Well, we will only be testing for very specific elements and plastics and we won't be labelling your samples individually so we won't be telling you anything about your individual results.'*

Ruth: *After the opportunity to ask questions, several of the students felt confident to consent. Some students wanted to give their consent but their parent(s)/carer(s) would not. For several students I telephoned parent(s)/carer(s) and again, once they had the opportunity to ask questions and felt reassured they consented. There was nothing further that I provided to students or parent(s)/carer(s) that was not clearly explained on the written consent form but it seemed that being able to have the opportunity to discuss their concerns was sufficient. Perhaps in future projects like this a joint briefing session with parents/carers (including the natural scientists undertaking the analyses) would be beneficial.*

Peter had been collaborating with Ruth in conducting action research at the school for a couple of years prior to this project. In this sense, Ruth was both a teacher and a co-researcher, and was instrumental to the form and content of the research in the school. Nonetheless, the voices of teachers often go un-heard in reflections upon childhood research – rather striking, since a good proportion of that research takes place in schools, where teachers act as both facilitators and gatekeepers. Whilst teachers and, increasingly, children may be involved in determining the ethical *conduct* of research (e.g. Robson, 2018), one of the contestations of this paper is that reflection upon the *ethics* of research with children might also involve a broader range of actors – like teachers. In this case it was instructive to have the recruitment process replayed to us from Ruth's perspective. Whilst we (academics) were pleased to learn that the atmosphere felt inclusive, what is striking here – as many researchers working in schools will probably know – is nevertheless the amount of additional (again care-full) work that not only we as researchers (as Polly recalls) but Ruth herself had to put in to afford children, their parents and carers opportunities to ask questions and provide consent. In particular, for *this* project, the questions centred on the biosampling, where there *was* a tension with one university ethics committee request – to provide detailed written instructions about the biosampling – where ongoing, detailed conversations and forms of response-ability were actually more effective (compare Taylor and Pacini-Ketchabaw, 2018). We reflect on some of these kinds of response-ability in the next vignette.

Alice

This vignette is structured into two parts, capturing distinct but related moments of a single round of bio-sample collections with a pair of female participants.

Collecting pre-lunch breath samples? Check. Now came the potentially more awkward part: asking for urine samples. Here goes… 'Okay great, thanks guys,' trying to sound nonchalant,

as though there was nothing unusual about my next question, 'Are you happy to provide urine samples?' The girls look at each other for a moment, both with sheepish expressions, 'You don't have to, if you don't want', I explain. Another moment passes. An almost imperceptible shrug of the shoulders. Something more unsaid. They both agree with a simultaneous (dragged-out) 'Yeahh[?]' and 'I don't mind'.

…

Having gained consent – much more readily – for taking post-lunch samples, I escort the girls to the toilets. The entrance to the space is open to the (empty) corridor, with no door (to prevent bullying). I enter with the girls, halting by the sinks, sufficiently in the room, but with enough distance from the cubicles. I hand the girls each a pair of gloves, a plastic(!) jug – for obvious practical reasons – and plastic tube.

I hover awkwardly inside the girls' toilets, bright blue cool-box and vivid yellow bio-hazard bag in tow. I glance occasionally into the empty corridor, knowing this is an unusual place to loiter and that my presence would likely not go unnoticed, but other students are still in lessons. A few minutes pass. The bell rings, signalling the end of the period (and the school day). Students begin filing out of rooms all around, the corridor becoming a noisy passage. A student enters, but goes quickly past me into a cubicle. There's a flush, signalling me to remove the lid to the cool box. The unmistakable sound of a cubicle lock sliding open and one of the participants begins to exit. I take a tentative step towards her, holding out the open cool-box- at nearly arms'-length- for her to discreetly deposit the sample. At that moment, another (clearly older) girl enters. She stops suddenly in her tracks, eyes darting between the box and plastic jug still in the participant's hand. 'What's going on here?' she asks, with evident suspicion. 'Just collecting some water samples', I reply (technically true?). She pulls a face, but says nothing more. Crisis averted. I think.

The first half of this vignette alludes to how negotiating consent when researching with children goes beyond the dyad of (adult) researcher and (child) participant. Often, child participants may feel they 'have' to do something requested by an adult researcher (particularly within the institutional setting of a school), added to the fact that their (adult) parent/guardian has already given consent. This vignette reveals, however, that consent *in the specific moment of data collection* also involves negotiation *between research participants* (compare Gallacher and Gallagher, 2008). Whilst we emphasised throughout that children did not have to participate if they did not want to, these participants looked to *each other* as to whether they should (could?) consent to providing a urine sample – probably the most unusual part of the project (and, by extension, what sets this project apart from the kinds of happenings in *social-scientific* studies of childhood, however 'interdisciplinary').

The rest of the vignette highlights the significance of the *spatiality* of this data collection (in a public bathroom, open to the corridor, at the end of the school day). Firstly, there is Alice's own awkwardness in balancing between facilitating the discreet depositing of the sample into the cool-box, and trying not to be too intrusive by hovering *in* the bathroom, a space where Alice felt her adult (though female) body did not belong. This is further highlighted by the tentativeness of her approach when the participant was leaving the stall, trying to give her as much space as possible. Clearly, Alice managed this in-situ and in-the-moment, although it is

notable that (again because of the specificities of a method like urine sampling) her conduct involved careful reflection upon her *embodied dispositions* and *presence* (compare Horton, 2008) as much as adopting a 'least adult' or 'honorary child' role (compare Atkinson, 2019).

Secondly, and resonating with Gillett-Swan and Sargeant's (2018: 1) exposé of the 'unintentional power plays' that occur when an unexpected interlocutor appears in a research setting (for instance a teacher during a focus group), it also captures an incident where another student (not part of the project) questioned what was happening, which likely raised anxiety/embarrassment for the participant, and which Alice attempted to diffuse by providing an explanation (of sorts). Critically, as children's geographers, we reflect that this was not only an outcome of our particular methods, but only occurred *because* of the (public) nature of the space (in fact the previous week saw a very interesting moment where two male students concealed their (empty) sample tubes up their sleeve as they walked through the corridor).

Amy and Polly

Amy: *Peter stands at the front of the classroom, reading a long list of elements found in the water samples the students collected from their school taps last week. 'Aluminium', 'Copper', 'Nickel*[ii]*'. I'd done some rudimentary googling of their potential sources but with a background in social science I really had no idea: 'pipes?', 'fertilizers?', 'water treatment?'. Some hands shoot up. The pupils are keen to know if these elements are harmful and what their effects might be. Peter reassures the group that everything was below the legal maximum levels. Well everything but the Boron. He explains that we need to run the tests again as the levels of Boron were above legal limits, but it's likely just a mistake. A hand shoots up again. What could happen if the levels were that high? We have to admit that we don't really know. In later conversations with Iseult, it transpires that boron occurs naturally in water and laundry detergents!*

Polly: *'So we can't see our photos after we take them? What about if we want to delete them?' Participants have their phones on the tables and some are managing to download the application which enables them to take photos of plastics. We walk out into the school corridors, testing the app, taking photos of the plastic recycling bins, the plastic chairs, plastic door edges. I explain that once the photo has been taken, it goes into an anonymous database. I add that they won't be able to see them again on their phone application but that we (researchers) will print them and bring them to the interviews. 'But what about if we take one by accident and want to delete it or want to see what we have taken?' another continues. While I explain that this is how the app is designed, I recognise that this might have implications for some students who feel apprehensive about taking photos of their everyday lives.*

These vignettes offer more specific, grounded details of ethical issues that emerge when emerging technologies are entangled with/in childhood research. However, whilst the second vignette echoes the kinds of *digital* technologies on which children's geographers have begun to reflect (e.g. Ergler et al., 2016), the technologies and processes surrounding the

biosampling are a reminder that – in interdisciplinary childhood scholarship – we may also encounter many *other* technologies besides apps, phones and social media. Both vignettes offer reflections upon the hesitancies, miscommunications and (potential) failures that emerge in research (e.g. Harrowell et al., 2018), but particularly when certain technical aspects of the research process remain somehow obscured for research participants, and when the researchers themselves are not entirely confident of their knowledge of what happens 'behind the scenes' (for further reflection on the use of mobile phone apps, see Hadfield-Hill and Zara, 2018).

Moreover, the first vignette opens out ethical challenges of interdisciplinary research that emerge during *analysis* – particularly when attempts are made (in doing 'participatory' research *with* children), by social scientists largely unfamiliar with 'the science', to feedback the early results of an exercise like biosampling. Perhaps this example highlights the limits of 'participation' – when perhaps it would have been better *not* to talk with children (Philo, 2011). Similarly, perhaps, as Bennett (2010) argues, it is here that social scientists might suspend (to some extent) their disbelief and allow nonhumans (in this case, the elements we identified) to do the talking, via the (admittedly partial) machines and forms of quantification that environmental scientists use to make-visible those kinds of materialities. In other words, in interdisciplinary scholarship, perhaps we have an ethical duty – particularly, but not only when working with ways of thinking and doing, after childhood – to decentre children so that the world's other ways of expressing itself can come to the fore. Or, perhaps this does not mean ignoring children in favour of numerical traces of elemental presences, but of finding (in this case, better) ways to express, juxtapose or articulate them alongside/within 'participatory' discussions. This particular instance highlights the difficulties of reporting on scientific results when the researcher does not really have the expertise to explain the details of what these results mean. There are clear ethical implications here: some of the children were deeply and, as it turned out, unnecessarily concerned (the boron levels were actually safe, and this was communicated back to the school, with the high readings resulting from a glitch in the measuring apparatus). Nonetheless – and there is careful balance here – the prospect of 'danger' led to heightened questioning and the students were arguably more engaged with the discussion. But was it worth the risk of upsetting the students through an inadvertent shock?

Ultimately, this vignette and the ethical implications thereof reflect a little of our (the children's geographers') naivety, as well as a missed opportunity for even greater interdisciplinary working by the environmental nanoscientists to be part of the participatory sessions. We had wanted to involve the environmental scientists in a trip to the school to talk about the biosamples – but this was not feasible in the specific time-period. We had also wanted to take the students to the lab to see how the samples were analysed. The wider (ethical) implication here – and again this is where the contribution of this paper goes beyond childhood studies – is that interdisciplinarity *cannot* simply be used as a blank descriptor, nor are its ethical implications only located at the planning/approvals stages. Rather, the very doing of interdisciplinary research is also a crucial consideration when it comes to analysis and feeding back to participants. In other words, we need to give greater thought to how interdisciplinarity looks and feels *with* our ('non-academic') research participants.

Peter

I sit down with Andy (the environmental scientist leading the lab analysis) and we go through a colourful spreadsheet with the raw data from the biosamples. There are hundreds of samples, each with a value (in parts per billion). Andy had done a huge amount of groundwork before we met, both in presenting the data in a format that was more readily understandable by non-experts, and in selecting potentially 'interesting' trends. He had identified particular elements of interest – including titanium, aluminium and zirconium. We start to discuss where these elements might have come from to be present in children's bodies and environment. Some come from food; some are airborne; some are the by-products of industrial and agricultural processes; others are deliberately added to foods, clothes, medicines and personal hygiene products. But I am also surprised by what Andy ***can't*** *tell me (although looking back, this should have been obvious): it is often not possible to tell* ***exactly*** *what the source of (say) aluminium found in urine samples was, because in its elemental, microscopic or nanoscopic form, one particle looks much like another. Moreover, there are multiple sources – cooking ware (aluminium pots and tinfoil), food packaging (cans) and food additives, personal care products such as anti-perspirants, etc.*

Then, to guide our speculations about where some elements that are the by-products of industry ***might*** *have come from, we use a mixture of our local knowledge and then open up Wikipedia to narrow things down further! We also use what I knew from the interviews with children about their everyday routines to speculate about where particular students* ***might*** *have come into contact with particular sources of particular elements.*

This vignette is evidence – if any were needed – that no one discipline has 'the answer', and neither is interdisciplinarity in itself 'the answer' (just as neither mixed methods nor triangulation cannot *necessarily* enable a true(r) picture of 'reality' to emerge). On their own, the data were interesting to Andy, as an environmental scientist. To Peter, they represented an exciting new way of witnessing more-than-human materialities – and of the kind so rarely, if ever, included in even posthumanist scholarship (see Horton and Kraftl, 2018). Yet, to return to a common theme, it was in thinking *collaboratively* with these data that even more interesting ideas emerged (which have significantly influenced other publications from the project).

All this sounds very cosy (and rosy); yet there are residual concerns here that relate more directly to three final ethical issues that have rarely been discussed. First, the vignette above is testament to the need for social-scientists to have *confidence* in their knowledges; Peter's knowledge of the children's mobilities was vital in piecing together where children might have come into contact with particular elements. Thus, in contrast with scholarship on the need for social scientists to 'adapt' (Albert et al., 2015), there is an ethical imperative to be confident in articulating about what we can add (Wilkinson and Wilkinson [2019] make a similar point, although gaining NHS approval is very different from talking with a colleague over a cup of tea!).

Second, consequently, we found ourselves – despite a commitment to posthuman methods that witness entanglement rather than individuated agency – re-asserting the value of attending to individual children's 'voices' about their mobilities, gleaned through fairly traditional research methods. This is, then, a potential challenge to the ethics of entanglement (and the methods that follow) that characterise especially commonworlds perspectives, even if the interdisciplinary approaches discussed in this paper might actually bolster those kinds of ethical attunements. The implications of this observation require more space than is left here; but suffice to say that potentially *more radical* forms of thinking and doing, after childhood, might require a sense in which (individual) children move out of *and (back) into* focus, even if they are recast in a rather different light. Thus, thinking *after childhood* is conceptually, methodologically and ethically both more modest and more challenging than thinking *post*-childhood (Kraftl, 2020).

Finally, and here we are inspired by Haraway (2011), there is a need to reflect further on the status of *speculation*. Speculation, and the telling of 'small' place stories, have become (rightly) important ways to challenge the phallocentric technofantasies of the Anthropocene (Taylor, 2019). And perhaps it should be celebrated that a scientist and social scientist can engage in an act of speculation. But, we wonder… . What does that mean for scientific notions of 'rigour' (could a version of this paper, referencing 'speculation', be published in a nanoscience journal, and what is our duty of care to each other as academics to retain 'appropriate' languages to describe our work?)? What does it speak of the arrogance of academic researchers – humble though we were trying to be – that we can engage in acts of speculation whilst, in the real world, millions of children are exposed to elements in potentially dangerous concentrations, and where it would, actually, be quite useful to *know*, definitively, what the sources of those pollutants were? And does this mean that, despite the potentialities of speculative thinking to open up new responses to current environmental crises (Debaise and Stengers, 2017) they have their limits too – and that still other modes of (interdisciplinary) relating are required?

Conclusions

This paper has opened out some key reflections on the ethics of interdisciplinary childhood research. Recalling a project about the entanglements of childhoods and plastics, it has focused on the kinds of (perhaps) more 'radical' interdisciplinarity that are still rare in childhood studies scholarship, but that are arguably needed to apprehend the complex challenges facing children, and the key ambitions of especially post-qualitative, post-humanist approaches to childhood. Its contribution has been three-fold: to offer deeper reflection on the more procedural research ethics of research, *after childhood*; to critically reflect upon some of the key ethical challenges that arise in interdisciplinary scholarship involving social scientists and scholars whose work does not routinely figure in childhood studies research (i.e. environmental nanoscientists); and, in the absence of such kinds of reflection both within and outside childhood studies, to provide a loose framework for future scholars looking to work across quite radically-different disciplines.

We end by collating key insights from this article, which meld the fairly procedural with/in broader, commonworlds-inspired ethics of care (even as some assumptions thereof are gently questioned). Conceptually, politically and – just as importantly – *practically*, these points taken together question, extend, and perhaps even dismantle stable, conventional notions of ethics. This is not only, as we indicate below, because ethical processes and practices enrolled a whole suite of other concerns that usually do not figure in social-scientific research (with children). Rather, it is also because of the (ethics of) care and collaboration, in which a far fuller range of agents was enrolled: ethics committees, teachers, children, digital and sampling technologies, and more besides. Clearly, a fuller consideration of how far concepts and practices of ethics can be stretched (or broken) is warranted, and we offer the following as starting points for such a debate.

First, we have emphasised that the successful navigation of ethical issues in this project was down less to social scientists having to 'adjust' to scientific protocols, but an *ethic of collaboration*. This meant that, for instance, social scientists made key inputs in the risk assessment and analysis of biosamples – but also meant environmental scientists taking the lead with some aspects of the institutional process.

Second, we outlined (reflecting on *risks* involved in biosampling) practical ethical issues that can arise – from avoiding embarrassment in transporting urine, to the storage, handling and disposal of samples. Some of these issues arose, in part, as a result of changes introduced in response to the ethics review and as such reflexive feedback to these committees will also ensue so that subsequent projects build on the experiential learning.

Third, we recursively viewed the biological *risk assessment* as both a straightforward, technical exercise but one that was – perhaps surprisingly – shot through with an ethic of care for children, researchers and the environment that could resonate with commonworlds approaches. We were also particularly surprised – the throwaway, wry comment that inspired the title of this paper aside – that there were few questions about the inclusion of children in the biosampling element. Perhaps this is heartening; but perhaps we should reflect on when it is 'too easy' (in other words this might not have been just our skill at filling out the form, but something *we* needed to continue to reflect on during the project rather than simply accept).

Fourth, we emphasised the importance of balancing our critical view of *ethics committees* with a sensitivity to the sheer amount of work, care, professionalism and support that we received. We would urge academic researchers – especially those involved in novel, complex interdisciplinary projects – to heed this point, since engaging with the ethics committee in a constructive way (and vice-versa) undoubtedly improved rather than hindered the project. Critically, this work took time: engagement with the ethics *process* might also – counter-intuitively – be part of an attitude to 'slowness' in postqualitative childhood studies.

Fifth, we have made a case for ensuring that children and teachers (and other professionals present in research settings) are not only involved in determining the ethical process, but in *reflecting* on that process. Having Ruth as both a teacher and, effectively, part of the research team was important both to the conduct and success of the project.

Sixth, despite the positive relationship with our ethics committee, there were inevitable *tensions* (for instance in *not* using the written instructions we had prepared for biosampling). It was – as the last point suggests – in our ongoing conversations with students, parents and carers where the real work of ensuring *informed* consent (and ensuring everyone was comfortable) was done.

Seventh – and this likely goes for many other methods that are challenging for research participants – we must recognise that sometimes the decision to take part in a method like urine sampling is not just a matter for *negotiation* between the researcher and participant. Rather, as Alice found, the (unspoken) opportunity for two girls to essentially check that they were *both* OK was vital to their participation.

Eighth, Alice's experience outside the school toilets indicates not only the importance of a researcher's embodied practices – as many childhood studies scholars have pointed out – but the critical role of *space*. Specifically, taking research to the school toilets opened out a whole new realm of ethical issues – especially when a student *not* taking part in the research appears without warning.

Ninth, we reflected on key ethical issues that can arise when using (new) *technologies* in research; not only social media, phones or tablets, but the whole gamut of technologies involved in something like biosampling. This can lead to hesitancies, miscommunications and expose the lack of knowledge of researchers. We considered ways that we could have addressed these failings, in particular in involving the whole team (including environmental scientists) in discussing the findings with students.

Finally, we critically reflected on the opportunities and challenges of speculation for interdisciplinary *analysis*. Although a critical tool in developing more-than-human ethics of care in commonworlds frameworks, there are (potential) limitations. We would therefore call for further consideration of how speculation may (or may not) offer opportunities for interdisciplinary collaboration and concomitant research impacts. Clearly, there is a need for much more critical reflection on the dispositions, techniques and competencies required for ethical, interdisciplinary (childhood) scholarship.

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[i] Rendering samples acellular means treating them in some way (e.g. freezing) so that they no longer contain (intact) cells, and are therefore not considered to be potentially harmful to humans or the environment.

[ii] As noted in the methodology section, the biosampling enabled us to test for a range of elements (mainly metals), alongside signatures of plastics such as additives.