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1 Introduction: ‘The Man Came Through the Door with a Gun in His Hand, “Show Me Your Ethics” He Snarled, “and Make It Quick”’

Wittgenstein: ‘My whole tendency and, I believe, the tendency of all men who ever tried to write or talk Ethics or Religion was to run against the boundaries of language. This running against the walls of our cage is perfectly, absolutely hopeless. Ethics so far as it springs from the desire to say something about the ultimate meaning of life, the absolute good, the absolute valuable, can be no science. What it says does not add to our knowledge in any sense. But it is a document of a tendency in the human mind which I personally cannot help respecting deeply and I would not for my life ridicule it.’ (A Lecture on Ethics)

Raymond Chandler’s reported advice to writers, “When in doubt, have a man come through the door with a gun in his hand.” seems particular apposite when considering the ethical aspects of HCI research ‘in the wild’, where doubt has become rife, sometimes to the extent that any certainty about research, ethical research, appears almost impossible. Wittgenstein’s position, expressed in the above quote, is quite simply that there can be no general ethical principles founded on facts. Our principles are, tout court, our principles and we are entitled to celebrate them. We should not pretend, however, that they have any evidence-based foundation. This because, as Moore (1993) put it in relation to the naturalistic fallacy, ethical statements cannot

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be reduced to natural facts (for those interested in such matters, this is a version of David Hume's proposition concerning 'is' and 'ought' statements). Such a view is, it has to be said somewhat controversial (see e.g. McNerny 1997) but in any case the point we want to make is that, in the rush towards establishing moral and ethical guidelines for research activity, relatively little attention seems to have been paid to the relationship between principle and practicality.

Of course, it is reasonable to suggest that everyone (excepting the occasional sociopath), regardless of social position, is assailed by ethical doubt on occasion. However, and it seems to us that this is an important matter, ethical doubt is, for most people in the course of their everyday lives, precisely an occasioned matter. Almost by definition, if whatever ethical stance we choose to take is obviously appropriate for the situation we find ourselves in, then ethical considerations will not normally arise. Ethics, for ordinary people, are foregrounded when troubles occur, troubles which have to do with questions such as, 'what should I do here?' or, 'did I do the right thing?', in other words by the realisation that the consequences of a decision are personal perhaps when recognising that an action may problematise one's reputation as a 'good person', by feelings of guilt, and so on. They are not, we suggest, typically questions of a general kind.

This contrasts with what we might think of as a fairly typical academic HCI stance (and here we are not so much concerned with institutional policies, IRBs and the rest, although we will refer to them). Trenchant analysis of the relationship between institutional procedures and ethics can be found in Hammersley (2009) which largely implicates theoretical commitments of one kind or another. That stance is more likely to be taken in advance of the design work, or results from reflection after design work. Thinking in advance or reflecting post hoc may be occasioned by the realisation that a policy (design or otherwise) has had unforeseen, and unfortunate, effects. It also may be occasioned by a more gradual realisation which is not consequential upon a specific event but may be thought of as having to do with our accumulated experiences in our chosen community. It may associate, for instance, with the realisation that we have no coherent means by which to judge possible effects in advance and so might need to develop them, by the realisation that possible ramifications may not be desirable (Winner 1980), as a result of reflection on the way in which new mediating technologies can prescribe behaviours (see Verbeek 2006, 2008), by the principled need to inject an explicitly ethical approach into the decisions made, or by the somewhat cynical recognition that institutions and individuals need to protect themselves from legal and other ramifications (newspapers, television and the social media are never far from our minds). Regardless, it is likely, we feel, that at some point theoretical commitments come into play, and may be analysed from a number of disciplinary auspices. Again, it should be obvious that these various theoretical commitments do not all share exactly the same features (although they all, in some sense, implicate a degree of generality). They may, like philosophical positions, be (for the most part) highly abstract; they may draw attention to various kinds of power relationship; they may be prescriptive and/or they may be empowering. We need to stress that we have no objection to any of these goals. Like Wittgenstein, we 'cannot help respecting'. What we will suggest, however is that the kinds of ethical guid-

ance provided are not often enough accompanied by in situ descriptions of ethical problems that actually occur.

Philosophers, not least, have spent a vast amount of time considering the nature of moral and ethical problems from a variety of perspectives (see for example Becker and Becker 2003; MacIntyre 1988; Berges 2015) on teleological, deontological and virtue ethics. These reflections have sometimes been brought to bear on design (see for instance Whitbeck 2011). It is not our task here to adjudicate between ethical theories, but rather to point to an issue raised in consideration of one specific approach, sometimes disparagingly known as ‘trolleyology’ (see Foot 2002; Edmonds 2013; Singer 2011a). The ‘trolley method’, as O’Connor puts it (2012: 243), involves, *‘discussing the use of trolley problems ... which offer perhaps the most extreme instance of treating imaginary hypothetical cases as the raw data for a quasi-scientific approach to ethics.’* It involves the construction of hypothetical ‘thought experiments’ of which the best-known is the one where the driver of a tram/trolley is forced to make a choice between staying on the line and killing five people who are tied to the track after his brakes fail or deciding to switch to a spur and thereby killing one (also tied to the track). In the ‘fat man’ problem, we are invited to actively throw the fat man off the bridge in order to save lives. Now, ‘trolleyology’ is of no particular interest to us (apart from the fact that cases of this kind are quite amusing), but it does indicate a wider issue. This is, as Wood (2011) puts it, that: *‘Trolley problems ... abstract not from what is irrelevant, but from what is morally vital about all the situations that most resemble them in real life.’* In other words, whatever philosophical, or other theoretical, commitments one might have, it is only in the actual, real-life decision-making process that one will see what ethical ramifications are in play.

In much the same way, we find general commitments of various types in such orientations as value based design (e.g. Friedman and Kahn 2003); feminist theory (Bardzell 2010); participatory design (e.g. Mumford 1995; Kensing and Blomberg 1998; Bratteteig and Wagner 2014), user-centred design (e.g. Bødker 2000; Abras et al. 2004), critical design (see e.g. Dunne and Raby 2001, 2013; Bardzell and Bardzell 2013), ‘disclosive’ ethics (Brey 2010) and so on. In each case, unsurprisingly, we are reminded that we should be mindful of various interests and need to deploy methods which reflect and manage those interests. Again, and to be clear, we have no objection to the ethical principles espoused in the above- quite the reverse. Nevertheless, we contend that such general principles are largely a product of ‘before’ and ‘after’ reflections and, moreover, that typically they provide too little in the way of descriptions of what ethical issues actually arise in the research process, issues which may affect not only the researcher but also other participants. To give a flavour of the very contingent relationship between general commitment and actual problems, consider the following experience of one of the authors:

“So, I gave the usual guarantees, of course. I had a meeting with all the people I would be watching and specified that I wasn’t interested in individual qualities, and wouldn’t be naming any names. I had a separate meeting with some middle management and told them exactly the same things. To cut a long story short, it was obvious to me when observing work in the office that one of the women there was the fount of all wisdom. Everyone went to her for advice about procedures. Anyway,

once the observations were all done, the management team called me in for a debrief, and one of the first questions I was asked was, ‘so, what do you think of (this woman), because we don’t think she’s very good.’ “I remember thinking, ‘Oh my God, they’re going to sack her.’”

The more philosophical, or at least theoretical, arguments about consequences, moral imperatives or particular virtues, can sometimes be contrasted with, sometimes supplemented by, the more mundane, but, to some extent more pressing and important ‘practical’ ethical concerns that arise in the research process. Whilst the philosophical approach seems to offer little in the way of resolution, merely comparing and contrasting the cold and unsympathetic reason of Kantian moral imperatives with the faux-scientific calculations of utility or an appeal to virtues that become increasingly difficult to define; a recent emphasis has been on what might be regarded as ‘practical ethics’ as a set of ideas and practices that shape the actual conduct of the research. Again, ‘practical ethics’ is something of a slippery concept—as Peter Singer suggests in ‘Practical Ethics’ (2011b): “Practical ethics covers a wide area. We can find ethical ramifications in most of our choices, if we look hard enough. ...I regard an ethical issue as relevant if it is one that any thinking person must face”—an idea that is not especially valuable or useful for most researchers. In these circumstances practical ethics divides into two: firstly, a set of largely bureaucratic or ‘audit’ concerns [as in Strathern’s notion of ‘audit culture’ (2000)] that emphasize institutional review or ethics board approval and that, especially in recent HCI research, has focused on a complex of issues surrounding the notion of ‘informed consent’ (see for example Rodden et al.). Secondly there are a range of related issues that centre on the ‘ethical’ treatment of participants and their relationship with researchers and the research process itself: as Crabtree et al. (2013) suggest, “Being real in this new era for HCI means going beyond the researcher as passing visitor or tourist of previous participatory design periods. It involves a greater degree of embedding and engagement with those with whom we seek to partner.” The management of these practical concerns is the central concern of this paper.

We should not overlap our complaints, for we are certainly not the first to be concerned and exercised by some of the practical ethics involved in HCI research in the wild. Waycott et al. (2016), for example, report on some of the ethical issues that arose in the course of their experimental deployment of Google glasses with what might be seen as vulnerable participants or sensitive settings. In the course of their project they identified four general ‘ethical’ themes concerning their own research practice, focusing on *high expectations and initial letdowns; effort, time and withdrawal; hope and self-depreciation* and *risks and vulnerabilities*. Particularly relevant here and to our own work is the theme of initial high expectations and what the participants thought they might gain from participating, followed, when these perhaps unreasonable, expectations failed to be realized, by some initial (and perhaps inevitable) disappointment and letdown.

Managing user expectations also features strongly in Taylor et al.’s account of ‘leaving the wild’ (2013); of what happens when a research project ends and everybody goes home (taking their toys with them). Users have been encouraged to engage in and commit to a research project and then, seemingly suddenly and without warn-

ing, the project ends. Despite the best intentions of the researchers, relationships that have built up over a number of years appear to be simply terminated, and participants can feel abandoned if not tricked or duped into participation. As they argue, this raises questions, philosophical, ethical and practical questions, about the way we do HCI research: “If we are designing interventions intended to have some positive impact on the lives of users, what happens at the end of the study? While researchers can leave this process with valuable findings, the technologies designed with the community are often simply taken back to the lab or redeployed with new users, leaving study participants without a technology they may have come to value and that is not available to purchase”. They then develop a set of guidelines for researchers involved in such ‘in the wild’ deployments that focus on managing expectations and resolving the resource and technical support issues that often emerge at the end of a project. These are fundamentally issues of practical ethics: “By making this clear at the very beginning, it allows prior planning for handover and may also help participants to decide on how much time and effort they are willing to commit to the project, which might be larger or smaller depending on whether they expect to keep the technology or not.... Expectation management, skill building and robustness are considerations that must have bearing on our decision-making throughout the development and deployment of prototypes.”

In ‘Five Provocations for Ethical HCI Research’ Brown et al. (2016) question some of the taken for granted foundations of ethical issues in HCI research, in particular the various ways in which “virtuous but impractical positions are advocated, and little attention is paid to how seemingly ethical positions can delay, damage or stop research”. They believe that ethics in HCI has its own distinctive ethics because of the way in which research technologies can impinge on people’s lives. The ‘provocations’ they propose as ‘tools for critical thinking’ include challenging the notion of ‘informed consent’; the thorny ‘qui bono?’ issue, or who exactly benefits from research; the importance and role of anonymity in HCI research; the purpose and value of institutional review boards; and the availability of research generated data. They suggest this approach highlights important ethical issues in HCI research: “The five provocations point to unintended consequences of regulation, oversimplifications of unresolvable moral conflicts, a bias in social desirability over what is ethical in effect, and a failure to consider the value of research”. Accordingly they propose ‘situated, ordinary ethics grounded, not on the classical philosophical positions but in the particular sensitivities and everyday judgments of research participants and ‘the practice of being ethical’: “Notions such as busyness, getting things done, minimising harm, altruism, and showing respect by understanding that the participants are also striving to behave ethically, need to be adopted to make ethical research become practical and achievable”.

Finally, in ‘The Ethical Implications of HCI’s Turn to the Cultural’ Benford et al. (2015) challenge the simplistic transfer of conventional Social Science ethical approaches to HCI identifying particular ethical challenges for HCI research and specifically its engagement with cultural applications (transgression, boundaries, consent, withdrawal, data and integrity) and consider some implications in

terms of managing tensions and challenges between overlapping ethical frames and how this in turn might promote Value Sensitive Design in HCI.

As ethical issues become increasingly important and problematic in social science research, this chapter reflects on our own investigations into some of the ethical considerations involved in the long-term research relationship between a university Computer Science department and user research conducted ‘in the wild’ in two ‘living labs’. We consider perceptions of the role and responsibilities of research grant holders to two rather different communities, the role of ‘lead users’ or ‘mediators’ in the communities, and various perceptions of participants themselves to the research process and the researchers. In particular, we consider two relevant issues: the effect of a long-term relationship with a community, and the delineation and relevance of ‘practical’ ethics in the process. What becomes clear from our interrogation of the available data is that issues of responsibility, including those of how we identify what our responsibilities might be; who holds them; what they entail, and how we discharge them are matters of the negotiated order. It has long been the case that engaged researchers have argued for the treatment of participants in a more reflexive way and we fully subscribe to such commitments. Nevertheless, in a context where research relationships are predicated on lasting commitment, they are not, and cannot be, determined by us alone. They evolve over time and in delicate relation to the needs and desires of our fellow research partners and participants—this is what ‘practical ethics’ entails.

2 Research Approach: The ‘Living Lab’

We use this chapter to document some of the findings of a detailed investigation into the ethical considerations involved in the long-term relationship between Lancaster University Computer Science department and two ‘living labs’. The first was the village of Wray, some 15 miles away from the campus, and the second various ‘feedback enabled’ student residences on campus. Although we have used these settings for a number of investigations—one of the advantages of the ‘living lab’ approach—here we are especially concerned with the deployment, use and evaluation of an interactive TV application and its impact, especially in terms of any experience of social connection. Here however, we report our conclusions concerning, firstly, perceptions of the role and responsibilities of project itself to the community of Wray, the role of ‘lead users’ or ‘mediators’ in the community, and perceptions of participants to research; and secondly, some rather different conclusions reached after discussions with a student population. Much of what we say here is predicated on a series of interviews conducted over several years but more recently focused specifically on the issues attending long-term relationships, including ethical matters. Interviews conducted specifically during the course of this evaluation were unstructured, both individual and group interviews lasting between one and two hours. Interviews were, with the permission of subjects, recorded. In all these conversations two issues were broadly salient: the ethics and impact surrounding a long-term research relationship

with a community, and the development and relevance of some notion of ‘practical’ ethics.

Such ‘Living labs’ have emerged in a number of different contexts, but perhaps originated in a concern with the domestic arena, in particular ‘smart home’ research, for example; Orange At Home (see e.g. Randall 2003); the Philips HomeLab (De Ruyter and Aarts 2004); Placelab (Intille et al. 2005); and the Helsinki Virtual Village (Eriksson et al. 2005). Følstad (2008) argues that ‘living labs’ typically fulfil functions of evaluating or validating new IT solutions; gaining some form of insight into unexpected uses and new opportunities; experiencing and experimenting with technology in contexts familiar to the users, and thereby enabling medium to long-term studies with users. As Schuurman et al. point out (2009) there are different, at least two, ways in which the ‘living lab’ can be constituted. Firstly, they can ‘make the technology or product available in the home of the users’ and secondly one can develop, ‘a home where the technology or product is available and where users come to stay for a certain period’—that is, the approach can emphasise either its ‘lab-like’ or its ‘living’ qualities. There are also other possible sources of variation, since such a lab can be located in a setting where people might stay for various periods of time; can be specifically targeted towards one user group; and can be more or less ‘naturalistic’. We draw extensively on the ‘living’ or naturalistic version of the ‘living lab’ perspective for our own research but the notion itself does not come circumscribed by methodological rules, which are more likely to be more closely linked to the phenomenon or technology under investigation. The nature and purpose of living lab sites is heterogeneous, and the evolving nature of the relationship between researchers and ‘subjects’ seldom discussed. Certainly, the nature of, and difficulties inherent in, research responsibilities towards the community have seldom been foregrounded and the evolution of shared responsibilities rarely discussed. Moreover, as Eriksson et al. suggest, various ethical issues concerning the appropriate treatment of, or stance towards, users, are apparent in the use of ‘living lab’ approach: “. *The human-centric approach in Living Labs conceives of human beings, citizens and the civic society as a source of innovation and not just as users or consumers in a narrow sense being an object for R&D activities ... (it) strives to break the trial and error process of product development previously described, and change that into a co-design process where users and developers actively work together*”.

Furthermore, and of some ethical importance, although it is argued that ‘living labs’ constitute an approach for including ‘interactionist’ perspectives, little is typically said in this perspective about the *role of analysts* or about *interactions between participants* in the process. One exception is Brown et al. (2011) who, in a thoughtful and insightful way, discuss the ‘messy details’ of field trial practice, focusing on some key issues—of interaction and demand characteristics—that they identify as under-rehearsed. They make a number of suggestions as to how to develop and demonstrate some sensitivity to these issues. They suggest, for instance, treating ‘investigators as participants’ in various ways and, conversely, treating ‘participants as investigators’. Taken together, these observations represent a methodological critique and point to the value in rehearsing both how social arrangements influence research results and how the same can be said of how researchers and ‘subjects’ interact. Here, then,

we take data from two quite distinct settings, both of which can be characterized as ‘living labs’ and seek to identify both the ‘contingencies’ of our approach and the degree to which the ‘troubles’ (our term) that Brown et al. deal with extend to this type of work and can become problems of ‘practical ethics’.

3 Technologies Involved and Background to the Case

A number of technologies have been designed, installed and evaluated in the village over the ten-year period in question. They include: the initial installation of a broadband wireless mesh network; a number of projects that looked at the deployment and use of ‘situated displays’ for community; a number of projects on interactive (peer-to-peer) television; and projects that examined the use of mobile phones for displaying travel information (for research examples see Harding et al. 2013). Lancaster University, and more specifically the Computing department, established a relationship with the village of Wray some ten years ago. The origins of the relationship were serendipitous and developed from community ‘push’ rather than research ‘pull’. As one very active member said, *‘we knew there was funding available for self-help rural broadband and we wanted to build a network. We heard that [a Lancaster researcher] was involved in a project and invited him along to talk to us. Initially, he said he had no funding but we wouldn’t let him leave and we rather bullied him, so they cobbled something together for us.’* The initial collaboration, then, was informal and involved the acceptance of responsibility on a more or less personal level. No formal ethical relationship was established at that point. The development of that personal relationship led to a willingness by key community figures to be involved in formally constituted research projects. In each case, grant applicants and consequent procedures have held closely to ethical guidelines established by research councils; the European Union, and the university itself. Nevertheless, over time, researchers who have relied on their contacts in the village have become increasingly aware of the perhaps changing nature of their ethical responsibilities towards the community and the individual villagers. These responsibility issues arise in various ways. Firstly there is the aspect of ‘communal consent’ and community ethics—individuals sign our ethical consent forms and yet often the community may be involved in aspects of our work—ethical responsibilities in a ‘living lab’ may accrue not simply to individuals but also to families and various social groups. Secondly, because ‘living lab’ research unfolds over long time periods, responsibilities may develop and change over the course of a project. In particular long-term involvement in a community sharpens the ethical issues that remain after research projects have finished—these concern both the data and the technology.

4 Ethical and Responsibility Issues

The university has always abided by codes of ethics defined both by research councils and their own procedures: before, during and after the research process. The point we make, however, is that such protocols, while necessary, are not sufficient, to the conduct of ethical and effective research. For convenience, we can distinguish the ‘formal’-guidelines, procedures, etc, and the ‘practical’-in situ relationships, obligations and practices. It is these that are our principal concern. We initially identified the fact that there were some ethical issues that had not previously been engaged with in the course of project work in the village and the university. It was felt that further effort needed to be made to identify what factors affected the success or failure of long-term relationships. Two researchers (the authors) assumed responsibility for the investigations, largely because they had both, to a varying degree, been involved in evaluative work in relation to various projects and hence already knew some of the participants.

Our investigations have centred on the village of Wray and ‘wired apartments’ in the university. Some contrasts, as we will argue, can be observed. The most striking has to do with the difference between ‘long term’ i.e. over many years’ duration and across several different projects, and more ‘short term’ (i.e. different individuals at different times with no mediating presence). In addition to interviews and focus groups, we have asked a small number of individuals to maintain diary records of their activities over the past 6 months and observed interactions on existing Facebook and Twitter sites (with the consent of participants).

4.1 *The Deconstruction of the Notion of ‘Community’*

While much is made of the notion of ‘community’ in relation to research into the Internet, for instance, it is evident from our data that this concept needs to be disaggregated in some way. Thus and for instance, the village in question has some 600 inhabitants distributed amongst 230 households. Age, family circumstance and individual interest have a powerful effect on knowledge about, and willingness to be involved in, university research. One evident feature is that some members of the community have needs that are more urgent than others. Some individuals live in isolated spots, some are old (including one resident who is over 100) and some live relatively impoverished lives on rural wages. The point here is that our involvement with the community inevitably brings both knowledge of these needs, and demands for their servicing (a simple example is a request to provide a means for the aged resident and others to be able to stream church services), demands which at best need prioritising in some way and at worst cannot be met at all.

Students, in contrast, live much more individualistic lives and, even if the word ‘community’ is appropriate for some purposes, it is not defined by the building in which they live. To the extent that they can be said to live in a community at all, it is

defined by patterns of friendship with an attendant set of social obligations. The point is that these tend to be much more fluid, and this may well define their relationship with researchers in the university as well.

4.2 *The Role of Mediation and Its Absence*

In the nature of research relationships of this kind, some individuals become more critical than others. These people often have a powerful mediating effect. They, for instance, have a crucial role in the enlistment of individuals and, in our sample, made decisions about the suitability of potential participants on the basis of their local knowledge. This also creates certain difficulties in relation to their role. Their sense of self-worth, their allocation of time, their awareness of the fluid nature of their relationship with other community members consequent upon their acquired role (as one respondent said to us, *'there are people in the village who will cross the street when they see me coming'*) are all delicately negotiated matters. It is not a trivial observation to say that here is an interactional arena where the personal and the political are very closely intertwined. In contrast the student population was notable for the complete absence of anyone who took on a mediating role.

4.3 *Trust—The Formal and the Informal*

One striking feature of our talks with participants was their indifference to formal ethical considerations. Most confess they had not read the ethical guidelines given to them in written form or available online. As one said, *'we're not that interested. If we didn't want you doing this work we wouldn't have anything to do with you. We get something from it and, as long as we do we're happy with you.'* As another said, *'my relationship with the university is brilliant, excellent. I don't really care what you're up to as long as I can see the benefit'*. None of this is to reject the importance of formal ethical structures. It does, however, point to maintenance issues that exist over and above formal statements of responsibility. These, it has to be said, have to do with personal contact between researchers and participants and on the nature of relationships in the community. Indeed, one of the ways in which participants assess university work is on the basis of judgements they make about individuals involved in the research process. They make frequent reference in our data to the difference between rather anonymous figures who *'flit in and out, repair stuff and then disappear'* in contrast to, *'X ... who is such a nice guy ... he always very helpful ... and he can be pressured [said with a smile]'*. We might also point to the fact that our own investigations of these issues prompt, to a degree, positive feedback on relations with the university, as in, *'it's nice when you guys are here ... sitting here with coffee and cake ... and you always make certain to fit in with all the other things we have to do ... that's very good.'*

4.4 *The Effect of Time*

In consequence, one obvious feature of a long-term relationship of this kind is that, and unlike other projects, it is not possible or desirable to ‘parachute in’. Obligations of a subtle nature are often evident. These include a willingness to be available at times relevant to the needs of community members, a need for technical expertise and support beyond the life of individual projects, and a nuanced view of entitlements in respect of ‘kit’. It also involves a recognition of the efforts made by participants. It was interesting to see the different perceptions of two leading figures in the village, both of whom have been heavily involved in research projects with the university and with other initiatives. While one, for reasons she identified as being to do with her own character, continued to view work with the university very positively, for the other frustrations over the amount of work she had had to do, and the communication difficulties she perceived meant that she had more or less ceased to collaborate. Both intimated, to differing degrees, that there were times when they felt ‘taken for granted’.

Further, although the conditions under which research will be undertaken are made clear and available to participants, it is not easy to remove equipment from them at the end of the project cycle if one has to rely on the same constituency again in the near future. This has led to a degree of negotiation concerning rights over equipment. As one interviewee said to us in response to a question about this, *‘I told [him], you’ll have to shoot me if you want to take that away. I rely on it and my kids need it. You can’t have it’*.

In conclusion, what was clear from our interrogation of available data is that issues of responsibility, including those of how we identify what our responsibilities might be; who holds them; what do they entail, and how do we discharge them are matters of the negotiated order. It has long been the case that engaged researchers have argued for the treatment of participants in a more reflexive way and we fully subscribe to such commitments. Nevertheless, in a context where research relationships are predicated on lasting commitment, they cannot be determined by us alone. They evolve over time and in delicate relation to the needs and desires of our partners.

5 Discussion—Researchers and Participants

We described our student population as members of a ‘Living lab’ but if so we need to disentangle some features of this in order to understand their reactions to the technology in question and how this might be understood as in part related to their positioning as subjects in the research and our (very limited) relation to them. We have already alluded to the fact that students were generally both experienced and expert in the use of existing digital TV facilities. One consequence of this was their reluctance to treat the research tool with any degree of patience. This, despite the fact that the device was being trialled was made explicitly clear. Oddly, the fact that

the set top box they were provided with had been manufactured to a high standard of 'finish' made them more intolerant when the remote control proved to be a little 'clunky' in use or when various services proved relatively difficult to use. They were, in short, intolerant of any perceived quality failings:

I'd be happy to download and wait a few days to watch content in order for it to be of higher quality

That is, when there was an overhead to the use of the system, students were generally dismissive. They demonstrated a manifest indifference to research interests:

I just want it to work, don't want to have to care about what's happening...

Our student focus group also had rapidly evolving expectations and were also acutely aware of their developing choices:

the precedent has been set regarding the cost of media distributed over P2P. People see it as a way of getting free content...

...at the moment we are just getting used to watching what we want when we want... it won't be long before we are demanding higher quality...

As a consequence, some students were quite negative about certain features:

what is the value added in terms of watching live TV over the Internet...?

This is not to say they were entirely negative, and they did consistently report that the ability to investigate programmes through a variety of functions embedded in IPTV was attractive to them: "*I like the ability to directly interact with programmes, for instance, to go onto the Internet to investigate particular aspects of a show*". More pertinently, however, it has to be said that these responses were at least to some degree a function of our own methodological approach at this point. It proved difficult to attract students to the study, and impossible to control to any degree their prior attitudes and expectations. Just as importantly, the fact that our contact with the students in question was at best occasional and opportunistic meant that no significant relationship between researcher and researched ever existed. No one involved in the research could usefully be described as a 'lead user' in Brown et al's sense. We believe that this, along with their previous sophistication, was a significant factor in the kind of responses we obtained. Put simply, rather than the kind of 'eagerness to please' that Brown et al. report on, our students were broadly indifferent to, and uninterested in, our research demands. As a result they were intolerant of fault. For them, the technology had been put in place for them to use, not to evaluate.

In contrast, our relationship to participants in Wray has to be understood in a very different way. Not least, our relationship with certain members of that community goes back a long way. As a Living Lab, the population of this small Lancashire village have been extensively studied as various technologies, such as public displays, have been trialled there and this fact, along with the different kind of social arrangements to be found in a small village, may explain some differences in the results we obtained. Similarly, being a Living Lab of some standing, the villagers have also got used to, and often enjoyed, a range of (occasionally bizarre) methodological research

techniques. In this instance we were interested in villagers experiences, preferences and expectations of TV viewing and accordingly, before the installation of the set top boxes, we deployed several ‘cultural probes’, using diaries and photographs, to gather some information on their television viewing habits. We then facilitated a simple focus group to gather some reaction to IPTV. In this case they had had an opportunity to use the system for a couple of months. We also engaged in a number of lengthy follow-up interviews. Just as importantly, we enlisted a ‘lead user’ to help us gather willing participants. This person not only acted as a proxy for the university in explaining the purposes of our research activities, but also acted as an intermediary in a more practical way, informing the research team when faults occurred, explaining to participants how certain functions worked- even providing support for the network. Now, ‘Carol’ as we shall call her, did not watch very much television. Indeed, she suggested that the only time she makes an effort to watch television is when specific programmes are recommended by her daughter, or when her grandchildren are in the house. On the face of it, this is quite different from the kind of ‘lead user’ reported by Brown et al. Here we have someone who makes little or no use of the research technology in question but nevertheless makes huge efforts on behalf of the research team:

It’s got to fit into your life ... it’s got to be of some use ... but for me, it’s a way of paying the university back for the broadband ...; they still fall by the wayside cos it depends on how busy you are, what you’re interested in, how much trouble it is ... but it’s my role to encourage them. What I would do, if we could get the chat working better, would be to use it to help ... give people instructions.

Working with the community, do you get frustrated?

No, I love it ... it’s so rewarding, I can do it all day ... showing people how to do things. They’ll come to you if they want something. To be entirely honest- I know you work for them- if anything is frustrating, it’s the university ... [goes on to detail various problems she has to contend with when working with researchers]

A striking feature of our villagers’ reaction to the system was their overall enthusiasm for its functionalities and their tolerance of fault. This was very different from the reactions of students. Hence:

I really like it ... I’ve been missing it on holiday ... I really like it ... I’ve found, with perseverance, that it’s much better now than it was when we first got it. I’ve got used to the Dalek voice ...

Dalek voice?

Yeah, you know the Dalek voice ...

Yeah, the noise distortion ... but by pressing the right hand button for ten seconds, it seems to get rid of it ...

This population of users, most of whom had been involved in other ‘technology probes’ were willing to investigate when things didn’t go according to plan, and were much more accepting of ‘failure’:

yeah, there are lots of things that are not altogether perfect like I can’t see the writing ... I’ve tried to wear glasses and I’ve found it quite difficult ... we’ve got a little telly and it

really does make it a problem ... I wrote down a list, let's see if I can remember ... it's quite erratic, the search ...

I found that, a programme you begin to watch one day ... you can't find the next ... that happened yesterday ... but on the whole I use it much more than I used to use the iplayer ... but overall, it's just easy to use ... from my point of view, I just go on to the searches, browse it, and find things I haven't seen ... I know it's on the box and I can watch when I like, and it's good.

You don't get the same problems as the iplayer ... I used to find that would freeze halfway through ... that's about being in the village [a bandwidth issue]...

(Researcher) So you're really positive about it?

Yeah

(Researcher) And is it to do with the flexibility?

Absolutely ...

(Researcher) And if you're being negative, it's the interface ...

The iphone is definitely the thing to use ... it makes things much easier and it's reliable ...

Our point here is that although this population of users was quick to recognize faults in the system, they were also keen to find its useful features. This, we feel, was a function of their awareness of their 'guinea pig' status, along with the fact that they were getting 'something for nothing'. Some of our respondents had participated in other trials and all were aware that such trials took place with a degree of regularity. There was, in short, a willingness to examine their own responses that that we did not find in the more critical student population. Thus:

(Researcher) Can I ask you about your overall experience of being guinea pigs? How do you find that generally ... the reason I ask is because there was a study done with students using a web-based version of this ... on the face of it they've got something they like and they're getting it for nothing, after all, and it seems that cos it's a research tool and it's not entirely shiny ... it seems that they were just intolerant of it and we were wondering whether ... because you're more familiar whether you're more willing to experiment, more tolerant ...

Yeah, yeah, it's fun ... you do realize that it's quite important and you're part of something ... and there's other things we have to get used to and you just think, oh well, it'll get sorted ...

We live in a village and we're used to it ... we got the most appalling television pictures year after year ... there were shadows all over the screen ... being part of your research and experiments ... it's great ... having the chance to use gadgets ...

Inevitably, and in contrast to field trials, the long running nature of our 'Living Labs' means that some of the recurring themes that emerge from our studies of TV use and expectations, in particular the regular emphasis on notions of control and choice, resonate particularly with Silverstone's (2005) notion of 'domestication'. The idea of domestication embraces a series of notions—"appropriation", "objectification", "incorporation" and "conversion"—that capture the transformations that a technology undergoes in becoming 'ordinary', in being 'tamed' and 'domesticated'. As Haddon (2007) argues; *"these describe how the entry of ICTs into the home is managed, how these technologies are physically (and symbolically) located within the home, how they are fitted into our routines and hence time structures and how we display them to others, and by so doing give out messages about ourselves"*. It

is in this sense that the Living Lab, (and our emphasis on content, interactivity and control) becomes particularly important as a research tool since, as Lehtonen (2003) suggests “‘domestication’ does not suggest one-sided control, but rather entails a state of becoming affected, as the term refers to a learning process whereby things and people reciprocally influence each other ... a new technology cannot become a success—or be perceived as a need—unless it passes the multiple tests and trials that potential users put it through. These have to do with the device’s image, its utility and the manner in which it can be fitted into everyday practices and relationships”. Whilst there is some theoretical debate over exactly how (and why) these processes occur our interest, and our problem is specifically design related, and lies in supporting the different needs of a variegated population of users. Students have time on their hands, rely heavily on friendship networks for their social lives and sometimes have very high standards when it comes to the robustness and functionality of equipment. They are familiar with, and expect, high quality ‘look and feel’. Villagers, and those with small children especially, have busy lives, are concerned for the moral welfare of their offspring, need ‘quiet time’, and so on. For them, the features they need are those that simplify the organization of their busy lives rather than those that extend social possibilities. The emergence of various functionalities for the new generation of interactive television will, we think, have to pay account of these differences. We suspect there may be many other sources of variation that are as yet opaque to us and the process of ‘domestication’ will ultimately depend on the discrete attitudes towards, and behaviours with, content, interactivity and control will need to be reflected in the design of the technology.

6 Conclusion: ‘Don’t Be Evil’—‘Do the Right Thing’

We began by contrasting a generalising tendency in ethical theory to a more ‘practical’ view, and arguing that an interest in the former does not always provide us with tools to help us determine ‘what to do’. This, we suggested, is because, as with Wood’s (2011) ‘trolleyology’ critique, such general views pay too little attention to the ‘moral vitality’ of human beings, to the practical issues (which can be of many kinds) they contend with. Our methodological and ethical reflections about ‘living labs’ reflect that. We have argued that they need to be understood in terms of two forms of interactivity—interactivity among participants (such that we can understand the importance of lifestyle; of prior experience; of ‘genre’, and of patterns of ordinary life) and interactivity between ‘participant and researcher’ (such that we can better understand the level of indifference towards research activity we saw among students and, conversely, the enthusiasm for the research we found among some villagers). Living labs have been promoted as a simple and cost effective way of both collecting information from users and involving them interactively in the development of new products and services, that is, as a form of ‘co-realization’ (Hartswold et al.). Concerns with ‘Living labs’ as a methodology have often seemingly focused on the degree to which they are either ‘living’, that is are ‘natural environments’ in which ‘real peo-

ple' live out 'real lives'; or the extent to which they have lab-like qualities that permit something akin to the manipulation of variables in the experimental method. What is less commonly discussed is the particular kind of social practices that generate user experiences in the more 'naturalistic' of these settings. In our student population we discovered a relatively homogeneous collection of experiences, views and attitudes dependent on something we can call a 'student lifestyle' and which needs further decomposing at some point in the future. The other, a village where the attitudes and opinions expressed depended both on the facts of village life; the long term existence of the village as a site for investigation and, more specifically, the rhythms of family life which inform the viewing experience. Our evidence suggests that the latter leads to a much more differentiated response. Our point here is that 'living labs' need to be treated as sites for social difference as much as anything else.

Overall, our studies suggest that the extent to which our participants are 'active' viewers, how they search and plan their viewing, who or what they trust in terms of guides to viewing and how would they might anticipate coping with any changes consequent on the introduction of interactive television depend on specific conditions in their social lives. Students and villagers, in our two studies, live very different kinds of life and their reception of interactive TV substantially depends on this. These two very different studies of current and future users of interactive television indicate some interesting variations, in current consumption or usage of TV, and expectations around future issues of content, choice and control. They open up some interesting theoretical and practical, design related, possibilities. For students, where peer group and lifestyle considerations are paramount, chat (in some form), recommendation and so on were welcomed. For our villagers, the rather more pressured nature of family life meant that functionalities that *assisted in the organization of their lives* were welcomed, those that potentially expanded their social interactions less so. The ability to structure viewing in advance for children, for instance, thus controlling not only content but also the length of their viewing was strongly welcomed by parents with young children.

Equally, as we have pointed out, the response of the two populations to fault was quite different. Students, it seems, have a demand for high quality and are unforgiving of fault. Our villagers are appreciably more tolerant and more willing to investigate sources of problems. The most likely explanation for this is that they are relatively regularly exposed to innovation and have developed a 'feel' for the kind of results that researchers are interested in. We should point out, however, that this is not the same thing as Brown et al. point to, and our results do not support their contentions about 'demand conditions'. Our version, as we argue below, has much more in keeping with Turner's (1970, 1974) who points out that more than one 'technical description' of an event is possible.

It does not, however, provide members with what to say about those activities. The point here is that, just as interviewers of whatever kind (doctors; the police, and so on) ask questions which are relevant above all to the task in hand, so do researchers. In much the same way, however, initial utterances, responses and so on by respondents will be given in accordance with how respondents *construe* the task in hand. 'Recipient design', that is, does not refer to responding in a way that the

interviewer wants, but to responding in accordance with what one knows about the interviewer (notably, that he/she may have an interest in certain technical matters) and, indeed, whatever other cultural resources the respondent sees fit to bring to the exchange.

Our research policies were such that it is probably true that we gave little opportunity for our student population to be ‘participants as researchers’ whereas our work in the village was more ‘artful’ and depended much more on a ‘lead user’ to field difficulties, make appointments for us, arrange meetings and so on. Having said that, our view of ‘demand conditions’ is substantially different from that of Brown et al., at least as we read them. Brown et al. see the issue of lead users as being connected in some way to arguments attending on the Hawthorne experiments. The troubled history of the Hawthorne experiments has been reported at length and we need not go into it here (see Brannigan 2017, for a useful review). Suffice it to say that—for Roethlisberger and Dickson at least—the behavior of groups was *causally* affected by the fact of *experimentation*. We see them, rather, as being associated with what ethnomethodologists call ‘recipient design’. Ethnomethodologists have, on innumerable occasions pointed to the way in which any sociological method, but notably interviewing, can be seen as the artful production of participants. (See e.g. Hester and Francis; Benson and Hughes; Stoddart; Cicourel). In the first instance, it can be argued, as Turner does, that the sociologist, ‘inevitably trades on his member’s knowledge in recognizing the activities that participants are engaged in ...’. Secondly, of course, the same is true for other participants. Thus, conversation can be seen to be ‘recipient designed’.

Now, this digression into the wilder shores of disagreement between ethnomethodologists and sociologists-at-large may seem sophist to an audience concerned with the practicalities and ethical implications of method but we want to show how it is, in fact, quite consequential. Brown et al. are not arguing that the ‘eagerness to please’ of lead researchers problematises the research but rather that knowledge of such matters helps us contextualize and evaluate our own research approach and perhaps the associated ethical practices. We do not mean to suggest otherwise. Having said that, our own participation in conversation with ‘subjects’ leads, in some respects, to a quite different set of conclusions. Lead participants’ are not necessarily characterised by enthusiasm for research. Working with participants is an artful business, both for researchers and for participants. Processes of domestication are not one-sided. Reward can, in some circumstances, be psychologically important.

7 Lessons Learned and Recommendations: ‘Implications for Ethics’

A number of lessons or what might be regarded as ‘implications for ethics’ emerged from this research—some of which support the findings of previous research but some of which are somewhat novel. For example, formal ethical guidelines, while

necessary, do not adequately encompass the ‘real’ issues. Indeed, we might go so far as to say that issues of ‘informed consent’ etc. were of little interest to our subjects, even when explicitly pressed on the matter. Similarly, methods need to be implemented which improve and facilitate regular communication between researchers and their ‘subjects’. Regular meetings explaining intentions, progress (or the lack of it) and encouraging feedback, facilitate understanding. Typical failures on the part of researchers can include not explaining in a timely way why there might be implementation failures; not explaining why problems cannot be dealt with ‘right now’, and not making research aims clear. Just as importantly, given the nature of different projects, heterogeneous research groups are not always well-known to participants. This impacts on trust.

Much like Taylor et al. (2013) and Brown et al. (2016) we insist that, as a matter of practical ethics, users be taken seriously. In the case of long term relationships of the kind we see in Wray, it can easily be forgotten that there is a significant investment on the part of some village partners in terms of time; acquiring expertise, recruitment and mediation. Without a constant, and two-way, process, this is not always understood. Similarly, both recruitment and long term willingness to engage depends on the work of community figures. One cannot assume a willingness to engage with research as a default position, especially in long-term work. Bad experiences with technology, in particular, affect willingness and the role of mediators is at this point, critical. The role of mediation cannot be over-stressed. The success of the university’s long-term collaboration with the village depended almost entirely on the ability of one, possibly two, people to recruit, persuade and engage. As ought to be clear, the level of commitment and expertise demonstrated by such volunteers is, not to put too fine a point on it, remarkable, and collaborations of this kind could not succeed without their work. It is notable that successive projects have ‘piggybacked’ on this goodwill, but efforts to maintain good relations and show the requisite appreciation need to be consistent. Similarly, our mediators have developed a considerable degree of technical expertise over the years and often involve themselves in significant repair and development work. This needs to be better appreciated and supported. This extends also to support for other participants who do not always understand technology in the way that researchers do. For the most part, ‘training’ has been very limited and mainly takes place at the beginning of project work. More regular reinforcement is certainly required.

In outlining what Brown et al. (2016) might view as mundane situated ethics, temporal factors become particularly important. It is both an advantage and a challenge for ‘living lab’ research that it unfolds over long time periods. This allows us to chart the ways in which responsibilities develop and change over the course of a project and also the ethical issues that remain after research projects have finished. This remains a problem with ICT projects ‘in the wild’, (e.g. concerning issues of ownership and maintenance of both ICT and data), and results in avoidance or rather unsatisfactory compromises. Even though documenting a single piece of research in a ‘living lab’ we are describing long- term collaboration, time is a relevant factor in the short term as well. The lives of most people are governed by a series of routines, and the lives of villagers are no different. What is evident is that the routines

of university researchers and those of villagers are not necessarily contiguous. In these circumstances reward becomes important. For some users, mere participation constitutes reward. More than one person reflected on the pleasures of participation, but equally that this was enhanced when ‘the university takes some interest in us’. Having said that, some frustration was expressed over the time it took to fix problems; the disappearance of technology at the end of projects; and over ‘being taken for granted’. One respondent, involved for the whole of the ten year cycle we report on, commented as an aside, *‘I’ve never received a single penny for what I’ve done.’* It says much about the relationship between researchers and participants that the two researchers present when this was said were somewhat shocked and dismayed. Comments to the effect that, ‘I had no idea she felt like that’ were subsequently exchanged. One further observation has to do with community- identified needs. Although there are evident limits on what researchers can do outside of the formal remit of the research, it is noticeable that appreciation of efforts made ‘above and beyond’ was significant. Hence, *‘X helped us a lot with the setting up of the mesh network, even though there was no funding at that time. He’s a very nice man.’*

Finally there are a number of areas where general ideas about practical ethics and particular notions about responsibility overlap. There is a need for clear allocation of responsibility. Our own feeling, based on our interviews, was that users did not always feel ‘championed’. They commented, as we have pointed out, on the somewhat reticent behaviour of (for them) anonymous people who ‘come out, fix the equipment, say nothing and then disappear ...’ They expressed some frustration at the inability of researchers to understand the demands of family life and its routines, and their inability to identify exactly who they need to be talking to. Clear allocation of responsibility for communication with participants at timely moments would help a great deal. But responsibility issues tended to arise in interesting ways: and we were concerned with documenting what might be regarded as ‘community ethics’—documenting the subtleties involved in mapping ethical responsibilities in a ‘living lab’ and the various ways these may accrue not simply to individuals but also to families and various cross-cutting social groups. Similarly we are interested in outlining some differences in ethical responsibilities towards individuals and their data. Research protocols generally assume a consistent and uniform responsibility towards every participant, but in the long-term research associated with ‘living labs’, individual involvement can change and evolve; some become ‘champions’ of the technology, others less interested. We are concerned with documenting how this plays out in terms of changing ethical responsibilities. The important aspects of responsibility identified in the case study, of community, the complexities of temporal change and data ownership and management and the development of increasingly ‘virtual’ techniques are likely to provoke considerable interest and discussion. Furthermore, this case study also facilitates our ongoing investigation of Silverstone’s notion of the ‘domestication’ of ICT, embracing the “appropriation”, “objectification”, “incorporation” and “conversion” of ICT in the mundane process of living with, and effectively ‘taming the technology’. Observing and documenting each of these processes has important and relatively underexplored implications for our understanding of ethical responsibility in ICT research. Given the growing interest

within the human computer interaction community in ‘value driven design’, these research findings should build into a framework of more general concerns, lessons, practices and values that are relevant to a range of technologies and settings beyond those directly involved in the study.

References and Further Reading

- Abras, C., Maloney-Krichmar, D., & Preece, J. (2004). User-centered design. In W. Bainbridge (Ed.), *Encyclopedia of human-computer interaction* (Vol. 37(4), pp. 445–456). Thousand Oaks: Sage Publications.
- Bardzell, J., & Bardzell, S. (2013). What is critical about critical design? In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 3297–3306). ACM.
- Bardzell, S. (2010). Feminist HCI: Taking stock and outlining an agenda for design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1301–1310). ACM.
- Becker, L. C., & Becker, C. B. (Eds.). (2003). *A history of Western ethics*. Psychology Press.
- Benford, S., Greenhalgh, C., Anderson, B., Jacobs, R., Golembewski, M., Jirotko, M., et al. (2015). The ethical implications of HCI’s turn to the cultural. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 22(5), 24.
- Berges, S. (2015). *A feminist perspective on virtue ethics*. Springer.
- Bødker, S. (2000). Scenarios in user-centred design—setting the stage for reflection and action. *Interacting with Computers*, 13(1), 61–75.
- Brannigan, A. (2017). *The rise and fall of social psychology: An iconoclast’s guide to the use and misuse of the experimental method*. Routledge.
- Bratteteig, T., & Wagner, I. (2014). *Disentangling participation: Power and decision-making in participatory design*. Springer.
- Brey, P. (2010). Values in technology and disclosive computer ethics. In *The Cambridge handbook of information and computer ethics* (pp. 41–58).
- Brown, B., Reeves, S., & Sherwood, S. (2011). Into the wild: challenges and opportunities for field trial methods. In *Proceedings of the 2011 Annual Conference on Human Factors in Computing Systems (CHI ‘11)* (pp. 1657–1666). New York, NY, USA: ACM.
- Brown, B., Weilenmann, A., McMillan, D., & Lampinen, A. (2016, May). Five provocations for ethical HCI research. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (pp. 852–863). ACM.
- Crabtree, A., Chamberlain, A., Grinter, R. E., Jones, M., Rodden, T., & Rogers, Y. (2013). Introduction to the special issue of “The Turn to The Wild”. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 20(3), 13.
- De Ruyter, B., & Aarts, E. (2004). Ambient intelligence: Visualising the future. In *Proceedings of AVI ‘04*, Gallipoli, Italy. ACM Press.
- Dunne, A., & Raby, F. (2001). *Design noir: The secret life of electronic objects*. Springer Science & Business Media.
- Dunne, A., & Raby, F. (2013). *Speculative everything: Design, fiction, and social dreaming*. MIT Press.
- Edmonds, D. (2013). *Would you kill the fat man?: The trolley problem and what your answer tells us about right and wrong*. Princeton University Press.
- Eriksson, M., Niitamo, V.-P., & Kulkki, S. (2005). State-of-the-art in utilizing Living Labs approach to user-centric ICT innovation—A European approach.
- Følstad, A. (2008). Living labs for innovation and development of information and communication technology: A literature review. *The Electronic Journal for Virtual Organizations and Networks*, 99–131.

- Foot, P. (2002). *Virtues and vices and other essays in moral philosophy*. Oxford University Press on Demand.
- Friedman, B., & Kahn, P. H., Jr. (2003). Human values, ethics, and design. In *The human-computer interaction handbook* (pp. 1177–1201).
- Haddon, L. (2007). Roger Silverstone's legacies: Domestication. *New Media & Society*, 9(1), 25–32.
- Hammersley, M. (2009). Against the ethicists: On the evils of ethical regulation. *International Journal of Social Research Methodology*, 12(3), 211–225.
- Harding, M., Finney, J., Davies, N., Rouncefield, M., & Hannon, J. (2013, September). Experiences with a social travel information system. In *Proceedings of the 2013 ACM international joint conference on Pervasive and ubiquitous computing* (pp. 173–182). ACM.
- Intille, S., Larson, K., Beaudin, J. S., Nawyn, J., Tapia, E. M., & Kaushik, P. (2005). A living laboratory for the design and evaluation of ubiquitous computing technologies. In *Proceedings of CHI '05*. ACM press.
- Kensing, F., & Blomberg, J. (1998). Participatory design: Issues and concerns. *JCSCW*, 7(3–4), 167–185.
- Lehtonen, T. K. (2003). The domestication of new technologies as a set of trials. *Journal of Consumer Culture*, 3(3), 363–385.
- MacIntyre, A. (1988). *Short history of ethics: A history of moral philosophy from the homeric age to the twentieth century*.
- McInerney, R. M. (1997). *Ethica Thomistica: The moral philosophy of Thomas Aquinas*. CUA Press.
- Moore, G. E., & Baldwin, T. (1993). *Principia ethica*. Cambridge University Press.
- Mumford, E. (1995). *Effective systems design and requirements analysis: The ETHICS approach*.
- O'Connor, J. (2012). The trolley method of moral philosophy. *Essays in Philosophy*, 13(1), Article 14.
- Randall, D. (2003). Domestic settings and new technology: A case study. In R. Harper (Ed.), *Inside the smart home*. London: Springer.
- Schuurman, D., Evens, T., & De Marez, L. (2009). A Living lab research approach for mobile TV. In *Proceedings of the Seventh European Interactive Television Conference*. New York: ACM press.
- Silverstone, R. (2005). 12 Domesticating domestication. Reflections on the life of. In *Domestication of media and technology* (p. 229).
- Singer, P. (2011a). *The expanding circle*. Princeton, NJ: Princeton University Press.
- Singer, P. (2011b). *Practical ethics*. Cambridge University Press.
- Strathern, M. (2000). *Audit cultures: Anthropological studies in accountability, ethics, and the academy*. Psychology Press.
- Taylor, N., Cheverst, K., Wright, P., & Olivier, P. (2013, April). Leaving the wild: Lessons from community technology handovers. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1549–1558). ACM.
- Turner, R. (1970). "Words, utterances, activities". In Jack D. Douglas (Ed.), *Understanding everyday life: Towards a reconstruction of sociological knowledge* (pp. 169–87). Chicago: Aldine Publishing.
- Turner, R. (1974). (Ed.) *Ethnomethodology*. Harmondsworth: Penguin.
- Verbeek, P. P. (2006). Materializing morality: Design ethics and technological mediation. *Science, Technology and Human Values*, 31(3), 361–380.
- Verbeek, P.-P. (2008). Morality in design: Design ethics and the morality of technological artifacts. In *Philosophy and design* (pp. 91–103). Springer Netherlands.
- Waycott, J., Munteanu, C., Davis, H., Thieme, A., Moncur, W., McNaney, R., Vines, J., & Branham, S. (2016). Ethical encounters in human-computer interaction. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 3387–3394). ACM.
- Whitbeck, C. (2011). *Ethics in engineering practice and research*. Cambridge University Press.
- Winner, L. (1980). Do artifacts have politics? *Daedalus*, 121–136.
- Wood, A. (2011). Humanity as end in itself. In D. Parfit (Ed.), *On what matters* (Vol. 2, pp. 58–82). Oxford, UK: Oxford University Press.