

**The grit in the oyster: questioning socio-technical imaginaries through
biographical narratives of engagement with energy
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Introduction

In recent years, scholarly and policy attention given to the importance of social technology assessment has increasingly marched in unison with perspectives in science and technology studies (STS) that conceptualise innovation and the social actors involved in it as unacknowledged legislators (to borrow Shelley's description of poets) of the world (Feenberg, 1999). Rather than separating the assessment of new technologies into scientific risk assessment and managerial regulation, newer perspectives view assessment as a process in which wider social values and priorities are as important as – if not more significant than – technical analyses of health or environmental risks. Assessing the viability, social desirability and legitimacy of new technologies is depicted as necessarily involving upstream public engagement (Wilsdon & Willis, 2004), inclusive and responsive responsible research and innovation (Stilgoe, Owen, & Macnaghten, 2013), and indeed broadening out to include both

official and unofficial processes constituting together an ‘ecology’ of participation (Chilvers & Kearnes, 2015).

Such forms of assessment are necessarily *ex ante* and anticipatory. They relate to potential developments which may or may not emerge. As such, an important task that must be undertaken is the assessment of imagined futures, as well as the assessment of the data and discourses upon which such future imaginaries are erected (Simakova & Coenen, 2013). The assessment of future imaginaries is an important contribution to understanding the ways in which often unacknowledged social values and past, contingent histories of research priorities constrain what future possibilities may be considered ‘imaginable’. This means that simply considering determinate risks (which may only reflect extrapolations from past data and established knowledge) and their attendant, less determinate uncertainties is inadequate. Focusing upon the imaginaries implicit in debates about future socio-technical developments demands we consider their wider social impacts (e.g. will they reduce or intensify inequalities?) and also reflect on what social and material infrastructures may emerge, supporting and being supported by them (Grove-White, Macnaghten, & Wynne, 2000). But there is also a need that we explore the desirability of the ‘worlds’ which may coalesce around these future socio-technical arrangements, the forms of life and practices which they may entail (Macnaghten & Szerszynski, 2013), and the ways in which overlooking the lived dimension of the social practices of which technologies are elements may undermine even the viability of socio-technical change (Strengers, 2013). This has been referred to as a ‘hermeneutic turn’ in technology assessment that moves the emphasis away from foresight focused on anticipating possible events – away from ‘future developments of technology’ towards ‘future societal developments with technology’ (Grunwald, 2014). This reflects the need to avoid fetishizing the constructions of uncertainty evident in many applications of risk analysis and to re-embed the assessment of socio-technical options within more concrete contexts of societal concern (Groves, 2015).

If the assessment of ‘future worlds’, practices and forms of life is a part of assessing the legitimacy, viability and desirability of socio-technical options, then understanding the basis of widening participation in such assessment is necessary. The question of ‘who participates’ includes not only *extensional* issues of inclusivity (which individuals are involved), but also *intensional* issues around inclusivity: under what forms are subjects ‘made up’ by participation processes and what capacities are permitted to be exercised within participation processes? Are subjects (and publics) imagined as primarily discursive, or are affective, embodied and emotional forms of engagement with socio-technical options registered within forms of participation (Davies, 2015)? Does the concept of ‘representation’ which informs participation rule in practices which speak in the languages that embody the bureaucratic traditions of governance institutions (like risk assessment), but rule out forms of expression that do not (such as vernacular evaluations of landscapes, poetry, and so on) (Farrell, 2009). What is the political significance of such processes of selection?

Among the assumptions which guide participation processes are ones regarding how and why technologies matter to people as participants in practices within lifeworlds. Work such as Strengers’ (2013) and Davies’ alerts us to the complexity of ‘mattering’ here (Sayer, 2011). In previous work from *Energy Biographies*, we have explored how people make sense of their everyday energy use in relation to valued identities and emotional attachments which help to constitute these identities and valued forms of agency associated with them (Groves et al., 2015, 2016). Viewing participation in practices through a psycho-social lens can yield insights into why people, for example, continue to participate in unsustainable practices even

when they are non-normative within their communities (Groves et al., 2016). In this paper, we explore how biographical and multimodal methods enable interviewees and researchers to explore the affordances of socio-technical arrangements for particular kinds of bodily, emotional and imaginative engagement, and thus to question future imaginaries which ignore or overlook such issues of engagement. In this way, qualitative methods can serve as media for eliciting forms of participatory technology assessment that go beyond considerations of risk, and even beyond merely discursive-reflexive consideration of priorities, to engage more embodied, aesthetic and affectively-charged forms of reflexivity (Lash & Urry, 1994).

Methodology

Across four case sites, first round interviews were conducted between 2011-2013 with a total of 74 individuals (pseudonymised). A sub-sample of 36 was selected to take part in two subsequent rounds of interviews and multimodal activities. At the most mainstream of our sites, the Royal Free Hospital (RFH) in North-London, we recruited interviewees from the hospital's employees. Still towards the mainstream are two areas in Cardiff; Ely and Caerau; a socially-deprived inner-city ward, and Peterston-Super-Ely; an affluent commuter village on the city's outskirts. Finally, the most niche case site was the Lamma/Tir-y-Gafel ecovillage in Pembrokeshire. Residents there live off-grid, have built homes from sustainable materials, and have land-based livelihoods.

While a biographical focus brings the past into the present, it also allows an exploration of anticipated futures, which presents specific challenges and difficulties. Each of the three longitudinal interviews featured distinct ways of focusing on the future through the lens of energy use, exploring both how individual experiences of biographical transition shape anticipated futures, and the links between how people imagine their own lives changing and shared future imaginaries. The project's multimodal approach exploited different ways of making the future more tangible to address the challenges presented by talking about the not-yet (Shirani et al., 2015). For example, after participants in the sub-sample had taken part in a photography task, they were asked, following discussion of the photos they had taken, to imagine life fifteen years in the future. Then, as part of the final interview, respondents were invited to view short films containing examples of future homes that featured a variety of ways of using energy. The first of these was a video from 1957 demonstrating the Monsanto 'house of the future', an exhibit originally part of Disneyworld's 'Tomorrowland'.¹ To initiate discussion, interviewees were asked to consider the differences between the present and how the future had been imagined in the clip, and whether there were features of the home shown in it that appeared particularly attractive or unattractive.

Following this, the second clip, from the 2012 UK Channel 4 (Ch4) series 'Home of the Future' featured the refurbishment of a multi-generational family's home with a range of technologies (including for energy generation and demand management). The programmes then documented the family's experience of everyday life in this environment. To initiate discussion, interviewees were asked to reflect on comparisons between the two films, and between the second film and their everyday lives in the present. A variety of technological innovations and practices relating to 'smart living' were highlighted within the programme. Interviewees' responses to these videos forms the main focus of our analysis below.

We opted to use videos as they provided a broader view of relevant issues, for example, depicting a number of technologies whilst also showing people's reactions to and interactions

¹ Available on Youtube at <https://www.youtube.com/watch?v=VowfYuhx1-o>

with them, which would not have been feasible to capture using static images. Whilst being an image and sound based medium, video can also capture and represent other senses (Pink, 2003).

Conceptual framework

Technologies, practices and forms of life (including cultural affiliations and identity) are not three separate and unrelated things. They are entangled and mutually constitutive of each other (Ozaki & Shaw, 2014), and may become increasingly so over time, as a complement to the path-dependence of broader processes of socio-technical change (Geels & Schot, 2007). How, as part of these entanglements, individuals become enrolled as participants in particular practices is a complex question, along with the additional question of how individuals reflexively introduce variation into practices. What exactly motivates people to engage in particular practices in the first place or defect from them, for example, is not clear. Recruitment to practices (such as becoming a vegetarian) may be shaped by the lifecourse transitions which may bring things, emotionally speaking, to a head for an individual and prompt decisive shifts in the practices one s/he engages in (Hards, 2012). People are not just 'dupes' of practices, as practices also matter to people in specific ways, and therefore may also cease to matter to them (or matter to them differently) in changing circumstances. This is recognised by some practice theorists in their discussion of the 'internal rewards' associated with practices (Shove, Pantzar, and Watson 2012, 75). But to understand what these rewards are, we need to ask questions about who the subjects of practices are.

We have argued elsewhere (Groves et al., 2016) that to address these questions, it is necessary to consider how subjects are, within their lifeworlds, participants in the taming of uncertainty through practices but also through emotional attachments to people, places, things, institutions and ideals. Practices matter to people in ways that are instrumental ('I have to do x in order to achieve y') but are also constitutive ('I am the kind of person who does x') of identity and agency. They thus give people the 'capability to 'go on' through the flow of largely routinized social life' (Shove, Pantzar, & Watson, 2012, p. 3). This taming of uncertainty is always vulnerable to being undermined, however. From participation, practices can become elements of identities. But these are not isolated as, engagement in practices is always undertaken within relationships of interdependence, which are both material in nature (enabling sustenance and survival, for example) but also symbolic and emotional. Practices are matters of concern (Latour, 2004), being bound up with creating and securing futures, but are also therefore matters of care, of active concern for these futures and their meaning (Groves 2011).

The subjects of practices are thus not only 'carriers' of practices through which interdependence is created, but are actively concerned with their interdependence and about the others they are interdependent with to greater or lesser degrees. At the same time, practices (and technologies) mediate and give form to our concern and care, and thus help to shape subjectivity itself and create emotional investments in particular ways of acting in the world. Practices and technologies bear affordances that make particular kinds of investment more likely.

This contribution of practices to the production of subjectivity is identified by Bernard with *attention*, in which a subject's diverse capacities for cognitive, emotional and affective engagement are gathered together to focus upon an object of care and upon the practices through which care is mediated and realised (Stiegler, 2010). Care, and the practices and technologies which mediate and help actualise it create a particular kind of relational

environment in which individuality (or rather what Stiegler refers to, after Gilbert Simondon, as ‘individuation’, an open-ended becoming-individual) is produced. Only some practices and technologies can help to create attentive care in this sense, however. Others obstruct it.

Stiegler contrasts attentive individuation with, for example, the fragmented forms of subjectivity solicited by forms of ICT-enabled communication, such as social media, which he names (after Katherine Hayles) ‘hyperattention’ (Stiegler 2010). Hyperattention obstructs individuation because the subject becomes absorbed in monitoring fragmented signals originating from a device on which a practice (like communicating via social media) is dependent. A similar attenuation of subjectivity, and with it, of identity, is identified by Casey (2001), who associates it with a broader socio-technical tendency to delegate agency to devices and infrastructures, which he argues ‘thins out’ bodily engagement both with devices that facilitate activities and (most importantly) the places in which they are carried out and in which everyday life is anchored.

Neither analysis means that practices and technologies which erode individuation do not bring satisfactions. On the contrary, all technologies and practices afford some kind of bodily, emotional, imaginative and intellectual comportment towards the world. But in psychosocial terms subjects become invested in different ways, over time, in the diverse modes of comportment supported by specific socio-technical arrangements. For example, the directedness to ‘objects’ of care as sources of meaning brings particular satisfactions from painting a landscape, playing with a child, or cooking a meal for friends. The periodic ‘hit’ produced by incoming emails, instant messages and tweets on one’s smartphone, coupled with the autonomy configured by the freedom to connect and disconnect with others facilitated by the device brings other satisfactions.

By conceiving of subjectivity as complex, and shaped by affective investments in this way, we can look again at the question of how to understand the entanglement of technologies and forms of life, by focusing on the forms of engagement that stitch them together. If technologies and forms of life co-produce each other, then their evolution can be seen as entrenching or transforming particular forms of engagement, and with them, forms of evaluative subjectivity that coalesce around distinct kinds of investments. If future imaginariesprehend (Michael, 2002) nascent ‘worlds’ around entanglements of future technologies and forms of life, then one question that suggests itself is how desirable these worlds appear from the point of view of evaluative subjects, cultured by their own characteristic mundane forms of engagement and concern with the socio-technical arrangements through which their subjectivity is refracted (Michael, 2015).

Energy Biographies Interviews: Care, engagement and friction

Narratives of domestic technological change have been explored in relation to values like comfort and convenience (Shove, 2003). These complicate views traditionally held of the far-reaching labour-saving and liberating effects (especially for women) of domestic technologies (Greenwood, Seshadri, & Yorukoglu, 2005). To some extent, older interviewees in our study often recounted memories of the advent of gas or electric heating as stories of liberation. The internal emotional and symbolic rewards of the practices of heating supported by such technologies (using the boiler, charging storage heaters) were represented as very significant for people used to cold houses and open fires.

It’s the best thing in the world that happened to me, was going from coal that we had over in Hywel Dda there. But when I first moved from Cambria Road to Heol Deva that was a house

of, it was unbelievable, we had central heating and I was only 10, in all the rooms, a steel house, wonderful, wonderful. (Jeffrey, 60s, Ely)

In these narratives, older practices that had died out were seen as involving a kind of effortful engagement that was often described as drudgery or mere ‘hard graft’ (Jeffrey), such as shovelling coal for open fires. Interviewees were glad such practices had died out. At the same time, there was widespread ambivalence about the meaning of the ready-to-hand nature of domestic services provided more widely through technologies keyed to convenience. Monica (RFH), talking about the extent to which convenience orders everyday life, goes on to say:

We don't think about it twice I mean putting the microwave on or the kettle on or the cooker on is not, you don't kind of hmmm do I really need to do this? You just kind of do it and then even if you don't drink the cup of tea or you change your mind later the kettle has boiled and what's done is done and that's it and you move on with life. I think yeah just a bit more blasé about yeah well it's there, and it will always be there and it won't.

Here, convenience is seen as encouraging care-lessness, a lack of concern for the consequences of what one does. In the films shown to interviewees, future imaginaries of convenience and smartness were manifested in depictions of increasing ready-to-handness of cooking, heating, and communication services. Reflecting on this, Jonathan (Peterston) described the forms of life in the films as manifesting ‘heedlessness’. Even more emphatically, others picked out additional negative aspects of the Ch4 film’s depiction of smartness.

Like the fridge that re-orders [...] I still think it sort of dumbs us down as a kind of society and replaces our you know ingenuity and our thinking, free thinking with controlled you know thinking and you know computerisation of everything (Dennis, RFH)

I don't know really what they are trying to do, I suppose they are trying to weaken you in a way you know kind of make you less and less able and capable of looking after yourself! You know you become so dependent on hi-tech gadgetry to survive.. (Joseph, Lammas)

Vanessa (Lammas) extends this theme of helplessness into that of fragility.

Yeah I mean [talking about the Monsanto house] it's hilarious in the whole kind of electricity of it isn't it? It's like you know [laughs] you're starving and the electricity is broken and you can't get into the bloody fridge or into the cupboard! [...]

Many interviewees questioned the contribution that convenience makes to a life genuinely worth living. It is here that the theme of attention and attentiveness, discussed earlier, emerges within interviews. For example, Sarah (RFH), having viewed the Monsanto and Ch4 films, discussed heating. She made a link between the absence of ‘homeliness’ from the Monsanto house and heating technologies.

[...] a log fire's is quite homely but obviously they didn't picture that in the future because its hard work making a log fire whereas they just press a button and they've got warmth or coolness or you know whatever they needed. Yeah there was no character or you know clutter or anything, everything was perfectly put away and a dishwasher yeah.

Interviewer: And you said about making a log fire that it involves work but is it a good kind of work or?

Sarah: Yeah like it's, it's rewarding you know just sit back and you look at a nice log fire [...]

Although there is an opposition here between an aesthetic of homeliness and one of convenience, this is not the ultimate focus of Sarah's reflections. Sarah goes on to distinguish between heedless, disempowered, fragile, convenience-focused forms of life, like those mentioned by Jonathan, Dennis and Vanessa, and another mode of living centring on a kind of care-full engagement.

I think we were saying about the log fire, its rewarding when you sit back and see the log fire whereas if you just flick a switch and it's there it's not as rewarding so who knows you know on how it effects our happiness in the long run things like that, don't know. (Sarah, RFH)

The values of such practices are not unconnected to appear to Sarah's descriptions, in her first interview, of an important lifecourse transition: how having a child led her to seek to make 'more of a home' and that warmth and comfort became for her key parts of the feeling of how 'home' feels, particularly in a hard-to-heat rented flat. Where convenience, in the sense of easy control over services (like heating), has a certain value which her own material circumstances make plain, Sarah sees in it a danger resulting from an implicit heedlessness and lack of control.

The value of effortful, care-full engagement for creating experiences of individuation is affirmed by Vanessa, talking about living with an ex-boyfriend on a boat.

[...] you are on a boat, the water will run out, the batteries need charging up, the food is going to last you so long and that thing about limited resources and having to really manage your resources cos, which is a metaphor for the whole planet in a way, that thing of having a limited amount and being aware of that and using it responsibly.

Here, interdependence is represented as a condition in which individuation (in Stiegler's sense) is made possible by particular material relationships of interdependence, particularly where this interdependence involves careful, involved attention on the part of a subject in tending to the needs of a human or non-human other (including e.g. fires or plants). Such relationships create an opportunity, in Stiegler's words, for a subject 'to have her own experience, that is, to learn something by herself in her constant confrontation with the real.' Such practices offer internal rewards that are not just tied to performing them well, but to the experience of physical and emotional absorption within them and the emergence of identity from out of this engagement.

I find it pleasurable to see things happening. I always found it really wonderful when I see anything growing and just planting a seed and seeing it growing on my windowsill, I've always enjoyed, I like birds singing and sunrises and sunsets and the stars and not having so much light pollution that I can't see the stars [...] I find the fact that I can design my plot and my own life in the way that I can without having to have the lifestyle of going to work every morning and earning money in that way and stuff like that; that is pleasurable but it's a challenge as well. (Anna, Lammas)

Here, Anna identifies features of a kind of subjectivity that she traces to experiences of emotional and sensory connection and which she associates with the demanding challenge of caring for other entities with which she finds herself interdependent. Part of care is the ‘resistance’ of the other. Such experiences are inherently effortful, because the other remains *other*, with singular needs and vulnerabilities that are not necessarily immediately knowable by the ‘carer’. Inseparable from care-full engagement is therefore a kind of affective and emotional friction, which contributes form to an ongoing narrative of care.

In Lammas interviews, despite the community’s forms of life being focused on low-impact living, contemporary technologies are fully represented. Yet the services provided by devices (washing, cooking, communication, education, entertainment) appear materially but also symbolically inseparable from other objects (smart meters, the home, vegetable and fruit plots, coppiced woodland, renewable power) that are objects of effortful care. Here, devices are emphatically not just devices. They become focal things through which relationships of interdependence are brought before subjects as objects of attention. It should be remembered that this biographical (but at Lammas, also shared) experience is at the heart of an experimental communal transition whose future goal is the ‘re-assembling of domestic life’ (Vannini & Taggart, 2014). A shift emerges within interviewees’ narratives regarding how concepts central to widely-shared imaginaries of convenience and smartness, such as ‘controllability’, are understood. Comparing her family’s use of a wood burning stove to her parents’ central heating, Emmanuelle notes that the central heating system offers push-button controllability, but immediately qualifies this statement:

Yeah but I don’t like that. I look back and I think actually I see for me how I had no connection with it, no connection you know, whereas when the wood’s there and you see the fire going you think maybe I’ll just turn the fire down cos the pile of wood is shrinking. Yeah I think it’s very easy if you have no connection with it and the bills just go out by direct debit and there’s no connection with the fuel that is actually being burned to produce this heat (Emmanuelle, Lammas)

Emmanuelle echoes here Sarah’s comments about log fires versus central heating. She sees her wood-burner as controllable but *differently*, a focal object whose meaning is conditioned by its relationship to other parts of a system that are equally within her sphere of influence and that of others she trusts. By the time of the third interviews, the availability of solar- and hydroelectricity meant that households could reconnect appliances that were ‘traditional’ conveniences, like washing machines. But these too were foregrounded and focal, rather than hidden in the background.

I can’t get over [Laughs] how wonderful my washing machine is. I think I’ve had it for maybe three weeks now. It’s just incredible, just incredible. [Laughs] [...] We have fan heaters. Which is very wonderful [...] We’ve got a kettle, an electric kettle. It’s very lovely. We have music. Stereo player, oh it’s lovely. (Emmanuelle, Lammas)

Emmanuelle’s enthusiasm and joy here undoubtedly reflect a long period (over a year) without readily available electricity. However, her story is not simply about a return to familiar comforts. Part of the satisfaction of the return of conveniences like the washing machine came from the fact that they had been installed as part of a system designed and built by her and her partner. The meaning and significance of the devices therefore changes. The meaning here of the materials upon which everyday practices rely derives from what Ingold calls ‘haptic’ rather than ‘optical’ engagement with things, a form of engagement of a

‘mindful body at work with materials [...] “sewing itself in” to the textures of the world’ (Ingold, 2011, p. 133).

Conclusion

Our data shows how narrative interviews, coupled with multimodal resources, can link together biographical experiences and social imaginaries in ways that solicit deliberation on ‘future worlds’ through engagement with the mundane, rather than through reflection on speculative socio-technical futures (Michael, 2015). The critical space our data opens up around smart imaginaries centres on the themes of effortful engagement and friction and its contribution to the significance of practices and of technologies. In particular, such friction appears to be an example of what Shove et al (2012) call an internal reward of practices. As our previous work suggests (Groves et al., 2016), rewards of this kind are connected with the production of valued identities and forms of agency through active engagement in practices, a process identified by Stiegler as individuation. Through these experiences, as our data from Lammas emphasizes, it is possible for individuals to come together in a remodelling of the mundane, and with it, of shared values like convenience and controllability which often seem to stand for irreversible processes of socio-technical evolution (Shove & Southerton, 2000)

From established perspectives in STS and practice theory, the emphasis in these findings on subjective experience may appear suspiciously like a return to a form of theory which views the interior world of the subject as enjoying a special status in relation to material reality. Our emphasis on care, however, affirms on the contrary that subjectivity is complex and often fragmented, and perhaps dispersed into embodied practices, emotional responses to others or disconnected reflections. At the same time, it also recognises the equally important point that such a subject is nevertheless an evaluating subject which lives through a diverse and sometimes perhaps conflictual set of forms of life, supported by complex entanglements of objective social and material relationships (Soper, 1990).

In this paper, we began from the idea that social technology assessment requires a critical space in which to explore the ‘worlds’ of future imaginaries. We have argued that particular kinds of thick qualitative data about the forms of life that technologies make possible is therefore equally as necessary to inform deliberation as are technical analyses of the viability of technologies. The combination of narrative biographical interviews and documents of social imaginaries (such as films) that we have presented here has allowed our interviewees (and us) to explore the implications of visions of future lives that centre on new realisations of convenience and smartness.

Convenience and smartness are imagined as good ways of living. This is because they are seen as promoting easy access to services or optimising the social allocation of resources. Yet as we have shown, many interviewees’ reflections on future imaginaries manifest concerns about these values that appear to be related to investments in particular kinds of practices that are reflected widely across very different case sites. An appreciation of the role of care and friction as the ‘grit in the oyster’ around which constitutively-valuable forms of subjectivity may form can awaken us to other priorities and ends, and indeed to other ways of imagining what concepts like convenience and comfort could come to mean. By building links between individual biographies and social imaginaries, we have demonstrated how a novel qualitative methodology can help us explore how different socio-technical arrangements can foster or undermine widely-valued forms of engaged, embodied agency through practices that solicit attention and focus.

The role of qualitative social science in supporting the inclusiveness and responsiveness of innovation under RRI has been recognised (e.g. Eden, Jirotko, and Stahl 2013). Here, we have demonstrated that insights from qualitative, narrative research can contribute to thinking about the objects of deliberative activities which form part of RRI processes – i.e. socio-technical imaginaries and their connection to mundane experience. One potential result could be to enrich RRI approaches to socio-technical assessment by facilitating deeper deliberation on the forms of life that socio-technical change may make possible, and on how assumptions about the meaning of concepts like convenience, comfort and control are open to change both now and in the future.

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