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Examining the Dynamics of Energy Demand through a Biographical Lens

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Examining the Dynamics of Energy Demand through a Biographical Lens

Abstract

It is widely recognized that a major challenge in low carbon transitioning is the reduction of energy consumption. This implies a significant level of transformation in our ways of living, meaning the challenge is one that runs deep into the fabric of our personal lives. In this article we combine biographical research approaches with concepts from Bourdieu's practice theory to develop understanding of processes of change that embed particular patterns of energy consumption. Through an analysis of "case biographies", we show the value of biographical methods for understanding the dynamics of energy demand.

Key words

biography, consumption, life-course, low carbon transitions, social change, social reproduction

Introduction

In recent years there has been growing attention within policy and academia given to the challenges of reducing energy consumption. Understanding processes of change and how change in energy use toward lower demand might be achieved is central to the work being undertaken in this area. In this article, we aim to show how biographical methods can be usefully combined with Bourdieu's concept of social reproduction to open up understanding of change processes that have implications for energy consumption.

Biographical research encompasses a wide range of methods that are directed at bringing pasts, presents and futures into view and formulating the interconnections between them. As such, the approaches and resources of biographical research offer important possibilities for unraveling "the different dimensions of lived totality" (Gottfried 1998: 452 cited in Wengraf et al. 2002: 246), shedding light on trajectories of social change and the role of people's actions within them. Here we seek to show that where the concept of social reproduction offers a way of conceptualizing change and the relationship between agency and structure, biographical methods bring means for researching such processes in ways congruent with these ideas.

In taking this forward, we analyze three biographical interview accounts generated through a large qualitative longitudinal research project, *Energy Biographies*. The biographical data derived from the research are treated as "case biographies". Each of the cases selected for analysis are examined for the insights they bring in understanding energy usage and changes through time that either contribute to its reduction or its increase.

Theory, Methodology and Methods

Theory: Biography, Practice and Change

In her work Elizabeth Shove has argued that there is a need to find methods “for understanding social order, stability and change in terms that are required and informed by theories of practice” (Shove et al. 2012: 4). Whilst Shove takes forward an approach focused on practices-as-entities, we respond to the call by drawing from biographical research and methods and combining these with a conceptual orientation derived from Bourdieu’s practice theory.

As with other practice theoretical perspectives, Bourdieu’s situates subjective meanings, which allow us to understand the world, as arising from embodied practice and relations with others. As a theoretical lens, it brings us to view much of what we do and what we conceive to be normal as socially reproduced. Bourdieu (1998) explains social reproduction in the following terms. He poses that objective social categories (such as the family) form the basis of corresponding subjective social categories – such subjective social categories are in turn the matrix of countless actions (such as marriages in the case of the family) that help to reproduce the objective social category. This cyclical relationship between the objective world we encounter, which is inculcated into our subjective mentalities and then enacted to reproduce the objective world, is what Bourdieu refers to as ‘social reproduction’.

Within existing research on energy consumption and practices, the notion of social reproduction has often brought a focus on routine and continuity. In Bourdieu’s formulation, however, he brings a way of thinking about *change as disruption* as well as change as continuity. Change as continuity is conceptualized as emerging through the gradual development of particular ways of doing (e.g. development of the family as a particular social structure which though it has changed over time represents a form of continuity with the

past). Whilst change as disruption is theorized as occurring through challenges that form in relation to socially reproduced ways of doing (e.g. breaking down of the idea of staying married, separation and divorce which represent forms of rupturing in relation to structures of family).

This distinction between disruption and continuity can be related to other concepts within energy research for thinking about change and transformation, notably, notions of incremental versus radical change. Here we do not infer disruptive change to mean radical change, nor do we refer to continuities as representing incremental change. Instead, disruption is a more subtle notion of how change occurs and for an action to be considered ‘disruptive’ it need only represent a form of challenge to an objective social category or structure. It is important to note that in this article, the concept is applied in a loose sense since the objective social categories being dealt with are less clearly defined. Moreover, instead of referring only to social structures (like family) we also use structures to signal the hardware of energy systems (such as technologies of energy provisioning).

This broad theory of social action and change is one we wish to take forward in our analytic endeavors but, as Shove has pointed out, the framing of social action at such a general level leaves many questions unanswered (Shove et al. 2012). Not least how these ideas might be applied in methodological and empirical projects that seek to understand action and change in the ways articulated through practice theories. Narrative and biographical research approaches have been highlighted for the ways that they can attune to practice theoretical conceptualizations of social action and change (e.g. see Mason 2004). Building from concerns mirrored in practice theory, the biographical research tradition has generated an empirically grounded “sophisticated stock of interpretive procedures for relating the personal

and the social” (Wengraf et al. 2002: 246) and researching in ways congruent with this conceptual tradition. Here we argue that biographical research approaches complement Bourdieu’s practice theory by offering a methodology that brings strong possibilities for investigating social change.

In the analysis which follows, we use a case biographical approach focusing on aspects of three people’s accounts that have implications for energy consumption and sustainable practice more widely. The case biography offers a basis for developing a compelling account of the person, of how and why events unfolded as they did and of the transformation over time. Thomson (2007) explains that the purpose of this kind of life narrative is to explain why a life was lived as it was, accounting for the number of ‘unlived lives’ that did not transpire, and in doing so give insight in to processes of transformation.

In contrast to approaches that follow specific practices, examine elements of practice, or focus on domains of practice, the case biography situates the person as the analytic unit and orients us toward a different strategy for making sense of the world in ways that attune to practice theories. We construct our case narratives by using what Saldaña (2003: 151) has termed ‘through lines’; ‘a through line describes, connects and summarizes the researcher’s primary observations of participant change’. Central to a ‘through line’, then, is the focus on change through time. We return to our use of ‘through lines’ in the following section where we discuss our research and methodology.

Methods: Researching through the case biography

The “*Energy Biographies*”¹ project (2011-2014) examines energy consumption as part of the life-course with a view to understanding how reductions in energy demand can be achieved.

The research has a qualitative longitudinal research design involving three rounds of in-depth biographical interviews in combination with multi-modal methods, conducted over a period of approximately one year. This intensive design (as opposed to an extensive study conducted across several years) has precedent in qualitative longitudinal studies and offers the benefits that are central to this approach, such as foregrounding issues of time and change (Saldaña 2003). The accumulation of data in qualitative longitudinal research arguably provides a better understanding of the individual (Thomson and Holland 2003), offering a more substantial base for understanding a person's life and the changes throughout than a one-off approach. The layering of information gives scope to analyze individual 'case biographies' (analyzing the data from individual participants to see how personal trajectories shed light on *processes* of change), which is the approach we adopt in this article.

The participants in the research were selected from across four distinct case sites within the UK (see map 1).

MAP 1 HERE

Case sites for the research were sampled along a continuum from *niche* to *mainstream*. We view *niche case sites* as distinct areas signifying the presence of "niche innovations, or spaces where things are done differently" (Hielscher et al. 2011: 4). By way of contrast, we understand *mainstream* case sites as being areas containing more 'conventional' ways of doing.

At the 'niche' end of our continuum is the Tir y Gafel eco-village part of the Lammas low impact living initiative – a sustainable off grid community based in South-West Wales. Further toward the mainstream are two Cardiff based case sites where community groups

have been active around energy issues – Peterston-Super-Ely, an affluent commuter village on the city's outskirts, and Ely and Caerau, a socially deprived inner-city ward. The Royal Free Hospital in London represents our final and most 'mainstream' case site; a workplace based community selected to allow for greater exploration of life across work and home.

In total, 74 people participated in first round interviews across the case sites and a sub-sample of 36 were selected to take part in two rounds of subsequent interviews and activities. The interviews across the three rounds involved discussion of everyday situations, events and contexts as a way to achieve reconstructions of life as it is lived in and through talk. For example, we asked about change in daily routines over time and at different points in participant's lives, exploring implications for their energy use. Participants were interviewed in locations in which they felt most comfortable, predominantly within the home.

At all stages participants were sampled according to their characteristics (e.g. age, gender, and lifestyle factors, such as family composition) with the aim of ensuring the research captures a diverse set of experiences and perspectives. The analysis in this article entails a detailed examination of the first round biographical interviews of three participants from different case sites; although as they are also taking part in the longitudinal research, this is informed by the wider understanding researchers have built of these particular participants' stories. The participants whose interviews we have selected for analysis have not been sampled with any notions of representativeness in mind, but because of what they offered in terms of speaking to emergent themes within the wider data set (see Thomson, 2007).

In focusing on particular biographical cases, the article aims to show how such an analysis can bring insights that have wider significance and relevance in understanding processes of

change through time. Such an approach has precedent in prior research (e.g. see Hards 2012) and has been scrutinized in methods literatures. For instance, Yates (2003) shows how readings of individual stories can bring to light historical and social trends of wider importance and reveal their intersection with personal lives. As noted earlier, we develop our case biographies using ‘through lines’ as an analytic strategy for describing, connecting, and summarizing our key observations of participant change (Saldaña, 2003). Thomson (2007) explains that the development of ‘through lines’ as a structuring device in case biography analysis entails drawing together all the data relevant to each field and sketching a narrative of change over time.

For our purposes, the through lines we take up are constructed around processes of change in the participant’s lives that can be used to reflect on persistent themes within the existing literature on energy consumption – *structure, agency and interconnection, values and beliefs, and norms and normality*. These themes are signaled in the subtitles that have been attached to the case biographies but each case speaks to all of the themes in their own way. In taking decisions about the through lines to follow, we chose to focus on the aspects of the person’s narrative relating to that which they identified as sustainable and unsustainable practice within their lives, as well as their stories of how their perspectives on environmental sustainability came into being.

In the following section, we weave our case narratives along these through lines in ways that help to open up thinking about how and why particular paths are followed, while others are not. We show how sometimes changes in participant’s lives lead to what can be considered disruptive forms of practice, while at other times, they result in continuities. In this way we can find a route into understanding processes of change that have implications for energy

consumption. The cases are presented as distinct individual stories with quotes from the transcript of each interview threaded throughout. All names used are pseudonyms.

Analyzing Biography: Continuity, Disruption and Energy Consumption

Mary – exploring structure, agency and interconnection

Mary is in her fifties, retired and lives alone in a “big” house situated in the village of Peterston-Super-Ely. Mary describes herself as having “always had an interest in sustainable living” having been “a geographer” working on issues of sustainable development throughout her career. She identifies travel as where her “preference to be environmentally friendly goes out of the window...for a number of reasons”. In order to understand how and why Mary travels, it is necessary to discuss her wider narrative of life-course change. This is important because, as will be made evident, mobilities are not simply about modes of travel but are tied to decisions about where we live, where we work, where our families are located and so forth (see Jarvis 2001).

Mary grew up in the North of England and has since “moved with work”. Her own and her husband’s work-lives were integral to their movements from Northern parts of the UK to the Midlands and then eventually to South Wales. Mary describes how her husband was “headhunted” and she “got a job” leading them to move to her current home. Though Mary is now retired she explains she would “find it difficult to move”; particularly because her husband has since passed away and the house was something they had “created together”. These past movements flow into her current life, which involves frequent long distance car journeys to see others of significance in her life.

“My Mum-in-Law is 90 and lives in Essex. My Mum is 83 and lives in Durham and both of them need regular visits so I do do a lot of miles”

This personal narrative brings in to view wider patterns of change and their roles in shaping Mary’s particular mobilities. Clearly development in road infrastructure over and above other forms of travel infrastructure plays a role, particularly with regard to her sense that the car is the most accessible and convenient *mode* of travel. Developments in planning with regard to housing and social trends in terms of the desirability of semi-rural locations could also be significant (see Powe and Hart 2011). The *movements* depicted through Mary’s biographical account can further be seen as influenced by trends in contemporary labor markets toward expectations and motivations for workers to be mobile (see Harvey 1990). That Mary now travels significant distances to see family members living in places where she and her husband once lived arises in large part through the movements made for and through their professional working lives.

Through Mary’s narrative we can see how practice is contingent upon and produced within and through historical, personal and social processes that then provide the conditions of possibility for future-making. Mary’s connections to her area, community and home mean she would find it difficult to change her present actions in terms of travel or to change to living in a house in a location that would reduce her imperatives for car travel. This is despite her concern about environmental sustainability and the fact that she no longer needs to be in this particular location for work. This has implications, then, for how we think about interventions that generate change toward more sustainable or (un)sustainable trajectories. In particular it directs us to think about long-term temporalities and intervening in ways that

address the wider conditions which shape our modes of travel and the distances we traverse, rather than the short temporal orientation associated with a decision to get into a car.

Though this part of Mary's narrative directs us to think about change as *continuity*, other parts of her story draw us to consider the formulation of more disruptive forms of change. She describes her interest in sustainability as contributing to a decision to install solar panels in her current home. This concern about environment was depicted as becoming salient at a particular time where a number of circumstances combined to bring a context for this more disruptive change.

“...it was an openness to looking to be more environmentally friendly plus the feed-in tariff at a time when interest rates were low, so people were able to say, 'I've got some money, I've got decent savings and it's not earning very much and, actually, I could be doing some environmental good and getting some benefit from it.” (Her emphasis)

Here it is possible to see the significance of national policy at play as this personal change to a home was, in part, facilitated through the UK feed-in tariff², which offered a financial return on the investment. The change is also interconnected with the global markets of solar PV production and development, as well as to the wider patterns of economic turbulence that have resulted in a low rate of return within other investment areas. These trends in financial markets and policy interventions combine with Mary's disposition with regard to socio-environmental sustainability to generate an opening for a challenge to existing systems of energy production and consumption. The community Mary lives within was also important for this change, as the support and “personal recommendation of a firm” she received from others in her locality that were also installing solar PV provided a form of security. From this

case, then, it is possible to see interrelations across scales from the personal, to the community, to the national and global, which intersect to generate openings for more disruptive forms of change.

The installation of solar PV also instigated a changed relationship for Mary with energy in the home: "...I think what the solar panels have done has made me think about when I do washing, when I should have put gadgets on in a way that I probably hadn't". In this sense, solar PV technologies can be regarded as holding some potential as 'disruptive artifacts' that contribute to different forms of engagement with energy and its consumption. Through this part of Mary's story it becomes evident how wider systems of provision have implications for and shape our daily routines and practices, and how challenging these systems can have effects in terms of changing forms of practice (like clothes washing).

Steve – exploring values and beliefs

Steve is in his thirties and is married with young children. He has lived and worked in Ely for almost five years. A prevalent theme throughout Steve's account is the central role his beliefs (Christian and socialist) have had in key moments of his life, which have inspired certain biographical trajectories with consequences for energy consumption. A key example of this is Steve's career as a community worker, which he describes as having been his "calling". Steve lives in the area where he works, a move that was prompted by his political and spiritual beliefs:

"... I decided with my wife that we'd come and live in the area as well [as working there] and that's kinda come out of a commitment... to try and support an area that's struggling...the inspiration for that I guess comes from my own political beliefs;

there's [also] a religious commitment, I'm a practicing Christian, so that was part of being here, trying to put into practice my beliefs about being with people in a struggling area and being a part of changing things."

Tackling social deprivation and injustice in Ely are the key imperatives that Steve wishes to engage with by "being here...rather than on the other side of town", not environmental or energy concerns. Yet his work has led him to engage with 'green' interventions as the means to help tackle such issues. For example, Steve was centrally involved in the development of a community solar PV scheme through his work. Though in developing this initiative he framed it in terms of the long-term economic benefits it could provide, he came to reflect on the importance of the environmental benefits of the work:

"I'm not naturally an environmentalist or anything: I'm rather a red than a green politically...I'm definitely a Socialist and I have a very strong sense of why I'm a Socialist and why I believe in that and about equality and poverty and all those sorts of things, and the nice thing about [community group]...is that it brings those two things together; you're not only lowering people's bills, it has a whole environmental impact as well."

Within his professional life Steve takes forward initiatives that challenge existing systems of energy provisioning (e.g. centralized supply systems) and practices associated with energy consumption. His involvement in doing so has been formulated through a set of interconnections relating (at least in part) to his beliefs, his resulting career decisions, and the possibilities presented by action within other spheres (e.g. government policy, funding schemes). Steve reflects on how his spiritual and environmental beliefs are not distinct but

intertwined: "...there's a religious side of it for me and if you believe that the place was created and given as a gift...you look after it". Through his life experiences, then, Steve has developed a consciousness about environment and energy. This has extended beyond his professional life to a personal desire to be "responsible environmentally".

In his account Steve reflected on the implications of his move to Ely for his own energy consumption. For instance, he revealed that the choice of house when moving was driven more by "the community...who actually we would be sharing our lives with" and less by environmental and energy efficiency dimensions. This focus on people and place as the most important dimensions of 'home', rather than the house itself, means "there are little things I [Steve] didn't spot" including having "windows [that] are really pretty poorly fitted and draughty". The move has also led to increased levels of travel for Steve both in terms of distance (e.g. visiting family in Bristol) and frequency (e.g. socializing with friends in the area of Cardiff where he lived previously). Steve notes: "I chose to be here and I could probably choose to leave if I wanted to." With this statement Steve suggests that it is possible for him to switch to a less energy intensive lifestyle by moving house. However, other aspects of his narrative reveal that this is not something he would really consider.

"Partly it's [not moving home] because we're settled now with the kids. My wife, when she was growing up, was always moving around different places, so she quite likes being settled now."

Similarly to Mary's narrative, in this extract it is possible to see the power of attachments to place and home at play. Whilst it may be possible for Steve and his family to move to a context where the environmental sustainability of their lifestyle could be improved, this does

not take account of such attachments and their importance in life decisions. Steve also reflects on questions he has about energy consumption, for example, he is unclear whether having a dishwasher would be more sustainable than washing by hand. The kinds of questions that Steve finds problems in resolving hint at the difficulties associated with knowing how to live sustainably.

His concern with social deprivation allows us to mark a distinction between the actions he has taken in order to challenge patterns of poverty and injustice (e.g. moving to the area he works within), compared with enacting challenges to environmental unsustainability. This distinction is related to knowing and the difficulties of knowing ‘how to be good’ in an environmental sense. In this regard, while Steve has clear ideas about what it means to act in ways that help address injustice and social poverty through his way of living, it is less clear in the context of socio-environmentally ‘good’ conduct. In this sense Steve’s narrative highlights how disruption can operate but also points to the clear difficulties involved in challenging existing structures, particularly in the environmental context where it is oftentimes unclear what ‘good’ means.

Roy – exploring norms and normality

Roy is in his fifties, lives with his wife and children in the Tir y Gafel eco-village and has a land-based livelihood. Through his account, Roy describes how his concerns about energy and environment emerged over his life-course. Initially, growing up in a comfortably off middle-class family, energy use was not something he was conscious of as a child. He recalled his father having a fuel “guzzling” car, and having a large oil tank to provide heating, which would be “on whenever they needed it”. Roy described this lifestyle as afforded by the middle-class affluence of the time, when oil was relatively cheap. In his account, he refers to

the 1970's oil crisis and subsequent price rises, indicating that this financial impact raised wider consciousness of oil consumption. Roy's environmental awareness deepened when he went travelling, which sparked his consciousness of living on a "wonderful planet" and raised concerns about "how many shit things are getting poured into it". It is interesting to reflect that his awareness was brought about through overseas travel and was thus facilitated by energy use in terms of transport. His changing consciousness, however, appeared to be influenced by the experience of staying in relatively low-consuming communities, and by concern about the environmental impact of high-consuming lifestyles, rather than a reflection on his own energy use in travelling.

"I grew up with conspicuous consumption if you like but gradually it was apparent to me the most important thing was the planet..."

This growing awareness prompted a change as Roy became more concerned about where his food came from, opting to shop predominantly in health food shops, and purchasing ecologically sound products, which went against normative cultural expectations at the time. During this period, Roy was living in conventional housing, often in cities, and was in employment. However, the lifestyle changes he began to make resulted in him being seen as outside of the mainstream. In this regard he describes his father's perception of him at the time: "he used to just joke for a long time that I was a hippy really."

In the past decade Roy and his wife have made more radical alterations to their lifestyle, living in low-impact dwellings and communities. The appeal of the Lammas Tir y Gafel eco-village was, for them, connected to the small-scale and relatively independent nature of the development, and particularly the ability to live a low-impact lifestyle legally as the site is the

first in the UK with planning permission. Their current practices represent clear challenges to almost all aspects of ‘normal’ contemporary life and its unsustainable consequences. This has meant engaging in practices that are not common in the UK (e.g. chopping wood for heat) and are of a very different kind than those constituted through centralised energy systems. Their lives involve not necessarily new practices but certainly reinventions of ‘old’ ones.

Alongside their environmental consciousness, much of the motivation for the move to a low-impact rural lifestyle lay in providing a positive environment for family life. Indeed the two are closely intertwined in Roy’s account, as notions of a ‘real’ natural childhood, promoting freedom and connection with nature, are contrasted with the “fraudulent” technological dependence he associates with mainstream childhood experiences. Despite the benefits they felt their lifestyle offered, Roy and his partner were keen to ensure their children were also able to engage in activities outside of the eco-village, and he emphasised the importance of the car for enabling his children to have these wider connections and social opportunities.

The Lammas site’s location in a rural area with poor public transport links meant that many of the residents were dependent on car use. Whilst Roy talks about their efforts to lift share “as much as we can”, he also notes how the demands of family life can necessitate car use. Here, then, continuities are evident in relation to energy use even within a radically altered lifestyle. Such continuities are in this case related to enacting other social structures – that of family – and are indicative of the how immediate demands (i.e. ensuring their children have social opportunities) can take priority over long-term concerns (i.e. about the environmental impact of car use) (see Shirani et al. 2013).

Whilst living low-impact lifestyles may be seen as radical, Roy invoked ‘tradition’ in

discussion of his practices. For example, Roy describes how the “sustainable option” of bathing their children in a tin bath by the fire was familiar to older generations of visitors and was “only weird to our really quite short generation span ... it's not us that's totally weird it's the fact that it's all exploded out like this that's weird”. By highlighting what he perceives as a relatively recent eruption of unsustainable lifestyles, traditional practices are endowed with a moral weight both in being positioned as more sustainable and longstanding. Subsequently, Roy's account illustrates how visions of ‘normality’ can change relatively swiftly. This is further exemplified in the way he describes his mother's perception of his lifestyle.

“I would say we started really changing it [lifestyle] ten years ago and [mother] thought it was awful, she was embarrassed; oh she was mortified and we were pikey, gypsy, travellers as far as she was concerned and it was awful. I would say three years ago, it started turning up in the colour supplements and it's all, it's getting trendy and everyone has got to have a yurt. We've almost got celebrity status now and so it's completely turned around... I think there has been a certain mad mainstreaming of this whole thing and I think the whole coffee table supplement glamorization of it all has, yeah certainly in our case it has played into our hands.”

The ‘coffee table glamorization’ Roy describes has transformed a lifestyle that 10 years ago was seen as extreme and embarrassing to something which is now ‘mainstream supported’. As much as Roy's biographical account offers insight into very different ways of living it also gives an image of normality, or of what is constructed as normal, at different moments in time and how this can change. This is important for understanding how Roy's lifestyle choices, which may be regarded as extreme, can create a basis for further unraveling of the

structures and categories made up through practice that have consequence for the energy intensity of people's lifestyles.

Concluding Discussion: Practice, Biography and Energy Consumption

Through this article we assert that a biographical analysis offers a grounded approach to understanding energy consumption and its transformation over time in ways congruent with practice theoretical understandings of social action. In the discussion which follows, we advance this argument using examples from our case narratives to draw out more specifically how a biographical approach achieves this aim. We weave our arguments around two key areas where the biographical lens offers insights and opportunities for understanding energy consumption in ways that can attune to practice theoretical conceptions. 1) The possibilities it offers for understanding the active role of the person and the interconnections between agency and structure within the realities of everyday life, 2) the core resources it provides for analyzing how and why change happens over time.

In taking a biographical methodological approach we present a way of researching energy consumption that responds to the challenges practice theoretical ideas pose for empirical analysis, i.e. understanding the role of the person in the social reproduction of structures – referring to both social structures, such as family, and the structures which make up the hardware of energy systems. Our analysis uses resources from the biographical research tradition, focusing on 'through lines' (Saldaña 2003). These through lines represent a device for exploring our participants' data and developing narratives of change that are pertinent to energy consumption.

For Mary's through line we focused on her narrative of car travel and the instance of her installing solar PV, along with the resulting impacts this technological structure has had in reconfiguring daily life. For Steve's through line, we developed a narrative around his moves to become a community developer worker, the ways that his awareness of energy and sustainability more widely connected with his work role, and the issues he came to reflect on in enacting his environmental concerns within his personal life. For Roy's case we reconstructed a through line around his move to an eco-village and his feelings about normality, and the actions that he regarded as a continuity of unsustainable practice within his current life. In setting out our case narratives around these through lines we are able to deliver insight into both the formulation of our participant's current ways of living, and into how their different concerns with regard to energy consumption and its reduction emerged within their lives. Further, we are able to open a window on the *active* roles of our participants in processes of social reproduction; we can show how actions are interconnected with wider social and material trends that in combination lead to opportunities for forms of disruption or continuity in social life.

For example, Mary's move to install solar PV can be seen to represent a form of disruption with regard to centralized energy production and the particular relations with energy that get made up through such systems. Equally we can see how Mary's actions contributed to continuities around travel, as she regularly made long car journeys. Perhaps more importantly though, we can understand *how* and *why* these particular actions came into being and, in doing so, bring into view the wider interconnections that were important in the participant's actions. Staying with Mary's case, for instance, we can see that a combination of moves in energy policy and other policy areas (i.e. relating to interest rates), together with features of her local community and her own existing beliefs about sustainability, brought about the

conditions that contributed to her installing solar PV. We can also see how her current mobilities were formulated over her life-course and through the moves she made within her life. These movements were connected (at least in part) to wider patterns within labor markets that brought with them strong possibilities for movement through her life. We can see, then, that Mary's actions with regard to travel contribute to continuities in wider patterns of personal transport use within the UK, but also how they are bound up with the enactment of structures (in this case around work and family) within other areas of life seemingly unrelated to mobility.

In Roy's case the major changes he made in moving to an eco-village signal multiple forms of challenge to currently dominant lifestyles. In particular his current ways of doing challenge socio-technical structures associated with energy systems (as he now lives "off grid") but also social structures, such as those around food provisioning and 'work' (as he now grows a significant proportion of his own food and works on his land where he also lives). In Roy's narrative we saw how his environmental consciousness arose through a set of travel experiences that brought high consumption cultures into focus for him. This combined with the opportunity that arose to purchase land at an affordable price and particular planning principles within Pembrokeshire (Pembrokeshire County Council, 2006) to bring opportunities for very significant changes in actions that disrupt rather than continue current trends. We also find actions in Roy's narratives that contribute to continuities – these arise particularly around car travel but a larger part of this narrative about travel relates to social structures around parenting. This directs us to consider the social structures that may *need* to be disrupted in order to open opportunities for the aim of energy demand reduction to be achieved.

In Steve's narrative his decision to move to an area where he felt he could have an impact, albeit in a wider sense of helping people "in a struggling area", formed a basis for community work initiatives that disrupt continuities toward increasing energy demand. In his case an awareness of energy and environmental concerns was prompted initially through the identification of potential funding sources that were related to energy within his wider community work. In this regard, moves in policy (i.e. the solar PV Feed in Tariff) and community funding supporting energy based intervention came together with Steve's existing Christian beliefs and desire to "change things", to result in his involvement with energy supply and demand reduction initiatives within the area he lives and works.

These case narratives in different ways signal complexity and interconnection as important for understanding processes of change. As Thomson explains, a biographical approach "gives rise to thick descriptions of individual lives rather than typologies of pathways of 'characters'. Yet these condensed accounts also capture the essence of the interplay between agency and ecology, the particular and the general" (2007: 581). These possibilities that biographical methods offer resonate with some of the core challenges that arise in researching energy consumption, particularly in terms of understanding the ways that wider patterns of energy use are lived and enacted. We can see, for example, how patterns of mobility are made and remade through actions taken every day, but that these in turn are made up in connection with other processes and patterns that intersect across our life-courses.

From our readings of the case biographies we get a sense of the agentive roles of our participants in challenging and (re)creating structures through doing, either in terms of social structures or socio-technical structures. Though these might appear as isolated actions within personal contexts that may not have even been taken in order to 'disrupt', when we

understand change in terms of social reproduction they take on a greater significance. They appear as forms of challenge to that which has gone before, which over time and in accumulation generate further possibilities and openings for change.

In our final reflections we want to turn to work that has drawn more closely on complexity theory for interpreting processes of change (see Urry, 2010). Though we suggest that our approach brings insight into how structures are made, remade and disrupted through people's actions within their life-courses, how we are treating the notion of intent and predictability of outcomes has not yet been dealt with. In this regard, we wish to argue that our participant's more disruptive forms of action can be seen as contributing to the constitution of 'spaces for thinking new thoughts, activating new actors, [and] generating new ideas within societies' (Eyerman and Jamison, 1991: 161 cited in Urry 2010). This does not need to be intentional and, indeed, we do not understand some of our participant's action as intentionally 'disruptive'. Nor do we intend to argue that the outcomes of what they do will be predictable or connected in linear ways, rather they form changes in the iterative patterns of practice that can offer openings for the breaking down of structures (see Urry 2010; also Shove and Walker, 2010).

In taking forward such a non-linear, unintentional conception of change, we argue that a biographical approach allows insights into the ways that actions form part of the making and remaking of structures, which in turn can begin to be undone by doing differently. We view such actions as intersecting with other forms of action in different spaces to create openings or close off opportunities for change. The questions arising from this analysis are thus transposed from ones of how to shift ordinary routines and habits, to ones concerning the ways that social cues can be generated, which offer possibilities for people to take up and

reinvent practices disrupting trends toward increasing energy consumption. Such reinventions then become cues that can open up further possibilities for change across the multiple dimensions of lived totality.

This conception of change presents a delineation of such processes that is congruent with practice theory but also draws inspiration from complexity theory and the moves that have been made within this body of work to go beyond a description of social change as resulting from agency (see Urry, 2010). Though we argue that a biographical approach brings a focus on agency, at the same time, we suggest that the analysis reveals how actions are often decoupled from intentions and certainly do not create change in linear, clearly measureable ways. In unpacking the condensed biographical accounts of the three people that have formed the focus for this article, we show the value of a biographical approach for embedding theoretical conceptions of the interconnections between agency and structure, and for revealing how and why changes occur through time. We argue that this offers a distinct way forward for researching energy consumption in ways synergistic with practice theoretical conceptions of the world and complementary notions of complexity.

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Notes

¹ www.energybiographies.org

² The UK Feed-in-Tariffs or FiTs were introduced by the UK government in 2010 to increase uptake of small scale renewable energy. The scheme entails financial payments for units of electricity generated. For more

information see Department of Energy and Climate Change:

http://www.decc.gov.uk/en/content/cms/meeting_energy/Renewable_ener/feedin_tariff/feedin_tariff.aspx