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Living-With Others, Living-With an 'Eco-Home': From Frustration to Transformation in an Eco-Development

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ABSTRACT *This paper considers how 'ordinary' families and individuals who would not consider themselves to have 'environmental values' or undertake sustainable practices are being transformed through 'living-with' eco-homes. The transformative process is unpicked, showing that frustrations with eco-developments not being 'eco-enough' may be more influential on the evolution of environmental values than the components of an eco-home which are prescribed and assessed by policy-makers. The findings are based on a single case study—the extension of Allerton Bywater in West Yorkshire, England. As a Millennium Community, the 520 dwellings were designed to the BRE EcoHomes standard 'Excellent'. The development was first inhabited in 2007 and the fieldwork for this research was conducted in 2007–2008 while inhabitants were getting acquainted with their eco-homes and adjusting to new ways of living. While other research focuses on scripting, appropriation and normalization, this research proposes the concept of 'living-with' as a model for understanding transformation in sustainable practices. The in-depth interviews were undertaken with couples and neighbours who shed new light on how individuals incentivize and motivate one another in the uptake of new sustainable practices, thus demonstrating the contingent and contextual embeddedness of sustainable practices.*

KEY WORDS: Eco-homes, sustainability, housing, STS

Introduction

Many approaches seek to understand the adoption of sustainable behaviours, the motivations for sustainable consumption, the uptake of sustainable lifestyles and the values and knowledge embedded in sustainable practices. Some of these are quantified (Barr, 2004, 2008; Barr & Gilg, 2006; DEFRA, 2008), while others are socio-technical (Ingram *et al.*, 2007; Shove, 2003, 2004) or psychological (Clayton & Opotow, 2003; Thomashow, 1995, 2002; Weigert, 1997). Instead, this paper

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undertakes a relational approach based on Ingold's theories of living-with environments (Ingold, 2000) and Evans and Abrahamse's theory of sustainable lifestyles as a process involving multiple assemblages of sustainable practices (Evans & Abrahamse, 2009) to understand living-with an eco-home as a transformative process.

The literature on eco-homes largely focuses on innovative grassroots projects such as those attempting to create an ideal autonomous environment which shields them from a changing climate Anker (2005); developments by eco-idealists (Fairlie, 1996; Pickerill & Maxey, 2009); environmental education centres, (Centre for Alternative Technology, 1995; Conrad, 1996; Seyfang, 2010); co-housing projects (Franklin *et al.*, 2011; Marsden *et al.*, 2010); and charities (Lovell, 2008; Smith, 2005, 2007). Pickerill (2012) has undertaken comparisons of grassroots eco-villages in Britain, Spain, Thailand, Argentina, and the USA; while Lovell (2005) and Williams (2008, 2011) engage with policy initiatives and seek to understand how lessons from the niche may impact the mainstream. Instead of focusing on grassroots developments, this paper focuses on eco-homes produced by the mainstream housing sector—which in the UK is speculative development by volume housebuilders—as a response to policy initiatives.

This paper firstly provides an overview of the literature on scripting, appropriation, and normalization; before introducing the concept of 'living-with' as a way of understanding how inhabitants of new build eco-homes reconcile with an environment that is designed to make their way of living more sustainable. The paper then outlines the methods for choosing the case study, conducting data collection and thematic analysis and then proceeds to tell the stories of six households at Allerton Bywater Millennium Community (ABMC). This is followed by a discussion of the key findings and conclusion.

Scripting, Appropriation, Normalization and Living-With

The consumption of housing is often defined as the purchasing or the renting of a residential property and research theorizes issues such as residents' choice, motivations and preferences in relation to different properties. In relation to eco-homes, consumption is more often related to the consumption of carbon, a measurable 'consumable' which can determine the eco-credentials of a particular house. These perspectives perpetuate the objectification of the eco-home and the separation between the inhabitant and the eco-home. Academics within science, technology and society (STS) seek to understand social and technological change in tandem and have developed theories to explain and explore such transitions. STS was initially developed by theorists who were critical of the 'purity' in 'pure' science and instead sought to develop a social study of science and technology. Woolgar (1988) was influential in developing this approach, regarding science as a social activity inseparable from scientific practice. This is significantly different from the sociology of science founded by Merton (1996).

A key concept within STS is 'scripting'. Most representations of the design process present a linear route through design, development, launch, consumption that leads to new practices. This view has been challenged by sociologists who stress that demand from the consumer may trigger development of new products and instigate the design process (Shove, 2003; Shove & Pantzar, 2005). This analysis can be extended to consider design and practice as a cyclical relationship (Ingram *et al.*, 2007). 'Scripting' considers the design process as one where behaviours are

inscribed into products by designers who wish to influence and direct behaviour—for example to encourage sustainable behaviour. As such the product 'configures' the user (Shove, 2004, pp. 25–26). Assessment tools such as BRE EcoHomes and the Code for Sustainable Homes can be seen as attempts to script the behaviour of both developers—in encouraging them to construct houses more sustainably in the specification of materials, insulation and white goods—and inhabitants, through the inclusion of cycle storage or compost bins.

In contrast, the 'appropriation' and 'anti-programmes' argument within STS provides an insight into how consumers or inhabitants may take a product scripted with a particular use or purpose, but appropriate it for other uses (Jelsma, 1999; Shove *et al.*, 2005)—a compost bin may be used as a waterproof container for storing children's toys instead of for disposing of kitchen waste and garden clippings. STS literature provides an insight into the ways in which consumables may shape and be shaped through practice, however the scale tends to be that of distinct items as opposed to that of an eco-home.

Miller (2010) suggests that homes, like clothing, are not empty shells which are then inhabited, but instead are chosen as a reflection of self, though the values and meanings embedded in a building may be more subtle than those in clothing. New ways of thinking about eco-homes are being introduced through initiatives such as the BRE EcoHomes rating and the Code for Sustainable Homes. Therefore policy-makers and architects should consider the 'scripting' of new ways of living embedded in the making of eco-homes. This may be more readily accepted by inhabitants than the rhetoric of 'official' and 'public' political discourse.

Hand *et al.* (2003) analyse the 'normalization' of regimes for showering which reveal both the limitations set upon sustainable practices and the embedded nature of unsustainable practices. Shove and Warde (1998) explore the choice to keep consuming despite the environmental consequences of increased demand and consider what they term 'inconspicuous consumption' of energy, water and other natural resources. The consumption of resources that Shove and Warde identify may be made visible through the installation of energy and water meters—however, these are only generally visible within a dwelling and are often hidden away. The consumption or purchase of eco-homes is conspicuous, but the requirement for inhabitants to change their consumption patterns is unenforceable. Renewable energy technologies such as photovoltaic cells, solar water heating and micro-turbines are far more visible as physical attachments to the home than existing technologies for energy distribution. Additionally, a change in patterns of waste disposal can lead to an increase in 'conspicuous' recycling and composting through the use of containers and a reduction in the 'consumption' of landfill sites.

This paper uses the term 'living-with' in two ways. Firstly, it is used in discourses related to living-with environmental change or long-term ill health or disease—'living with' cancer, autism, dementia, HIV, bereavement. The commonality between these is living-with-other. The other causes long-term change to the circumstances of life, is rarely chosen or wanted and often leads to fear and frustration. Kubler-Ross (2004 (1969)) describes bereavement as a process from denial, anger, bargaining and depression into acceptance and hope. Kubler-Ross's model has been adapted to describe organizational change through four stages: denial, resistance, exploration and commitment (Bovey & Hede, 2001; Cameron & Green, 2012 (2004); Jaffe & Scott, 1998; Vakola & Nikolaou, 2005). Figure 1 adapts this model and charts the relationship to eco-home against time in four
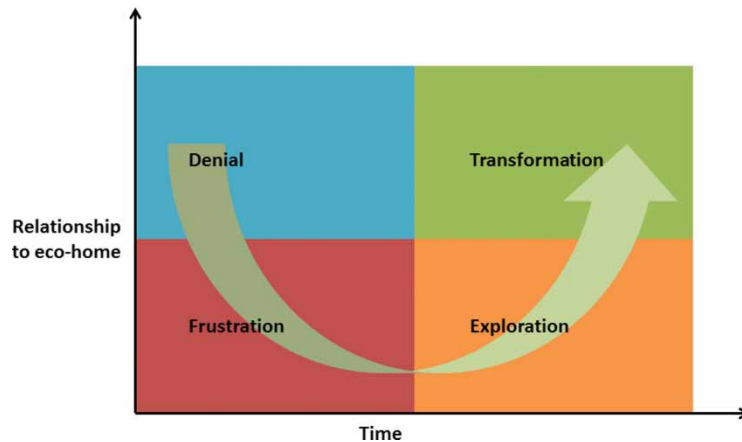
Figure 1.　The process of change in relationship to 'living-with' an eco-home based on Kubler-Ross (2004 (1969)).

stages: denial, frustration, exploration and transformation. Such a model antici-pates that the relationship of 'living-with' an eco-home will not be static but may change and develop over time and that conscious consumption of an eco-home may lead to more active engagement with other sustainable practices (Willis & Schor, 2012). Inhabitants may initially deny any difference between their new eco-home and their former home; may be frustrated that their eco-home impinges on their established way of living; may then begin exploring and learning more about their eco-home; and finally may undergo a transform-ation to their way of living and develop a strong commitment to their eco-home and related sustainable practices.

It is presumed that inhabitants of a new build eco-development purchase their home because of its eco-credentials rather than for its location and affordabil-ity. For those 'ordinary' consumers rather than eco-idealists, the eco-credentials may not be the leading motivator and therefore the eco-home may initially be treated as 'other', as something which frustrates and impedes previous ways of living-with a home. Yet the eco-home has the potential to transform ways of living and thinking about the world, about resource use, energy consumption, recycling, growing vegetables.

Secondly, the term 'living-with' may be used to refer to co-habitation—living with a housemate or long-term partner. In this second usage the partner or house-mate is chosen, is wanted, there is a sense of duration and commitment to the relationship but it may also present opportunities for frustration. An eco-develop-ment of hundreds of new houses is also about living-with a new community. It provides opportunities for neighbours to negotiate their collective understanding and practice with regard to recycling and car parking and may confound tra-ditional views of 'downshifting' as a retreat to a more reclusive life, and instead offer new forms of civic engagement (Nelson *et al.*, 2007). Inhabitants of eco-developments are engaged in re-making themselves and one another alongside re-making the way homes are made.

The concept of 'living-with' enables an understanding of the process of change that inhabitants of new-build eco-developments may experience. The model adapted from Kubler-Ross (2004 (1969)) and theories of organizational change provides a framework against which to benchmark the changes

experienced by inhabitants. This paper therefore examines the experiences of inhabitants of mainstream eco-homes and posits that the change in sustainable practices is the result of a transformation in values and meanings through living-with others, living-with an eco-home.

Methods

The case-study approach encourages the use of a wide variety of sources—including interviews, field visits and the collection of documents from official meetings—but does not determine the methods to be used. The research undertaken for this paper focuses on the relationship between inhabitants and their homes; the 'eco-home' is not investigated directly as part of the research process, but is instead considered through the experience of the inhabitants via semi-structured interviews and document analysis.

ABMC was chosen because it was a Millennium Community project, overseen by English Partnerships and therefore embedded in the making and re-making of mainstream speculative volume housebuilding, policy and assessment methods in England and Wales. The policy context is focused on enabling volume housebuilders to 'green' their practice. This offers an opportunity to understand both the production of eco-homes by speculative developers and the consumption of eco-homes by 'ordinary' inhabitants who would not consider themselves as environmentalists. The fieldwork was undertaken in 2007–2008 while some of the eco-homes were still under construction, whereas others had been inhabited in the previous 12 months. As such, this particular manifestation of 'eco-home' enables an understanding of the transformative process of the first 12 months of an 'ordinary' inhabitant and provides an in-depth insight into their experience of 'living with' an eco-home.

The research undertaken at ABMC focuses on the Miller Homes development, one of three housebuilders producing eco-homes on neighbouring portions of the same site. The other two schemes have been developed by Fleming-Fusion and Barratts. The Fleming-Fusion development was newly inhabited at the time of the fieldwork, so it was deemed that there was insufficient time for them to have experienced any significant transformative effect from living-with their eco-home. Ground works for the Barratts development had only just been completed so there were no inhabitants to interview.

At ABMC, research participants were approached formally and informally depending on their relationship to the development. The informal approach was used to make contact with inhabitants. The researcher knocked on the door of every house which was inhabited at the time of fieldwork and invited inhabitants to participate. Multiple trips were taken at different times of day to try and access those inhabitants who were either more likely to be at home during the morning, afternoon or evening. All inhabitants who wanted to participate were included, and interviews were conducted in the inhabitants' eco-home. Some interviews were with individuals, others with couples depending on the interest in being interviewed. Interviews generally lasted an hour and were recorded using a digital voice recorder. Some inhabitants were interviewed on more than one occasion and introduced the researcher to other potential interviewees.

The formal approach was used to contact those professionally involved in the development. Those who agreed to be interviewed are: the Regeneration Manager

for English Partnerships, two Architects for the Miller Homes scheme, a master-planner from EDAW, planning case officers, the project architect for the Fleming Fusion scheme, and two local residents who had opposed the development. Similarly, interviews generally lasted an hour and were recorded using a digital voice recorder.

After completion of the interviews, the recordings were professionally transcribed verbatim and checked by the interviewer. Interviews were conducted in six eco-homes, inhabited by eight interviewees. Although this number may seem low, it is 10% of the 60 eco-homes built by Miller Homes and inhabited at the time of fieldwork. Such a small sample size calls into question the generalizability of the findings, the extent to which the experience of living-with eco-homes at ABMC is representative, and, whether the transformative process is likely to be found elsewhere. As an alternative to generalizability, Lincoln and Guba (1985; Denscombe, 2010) suggest the concept of 'transferability'.

> 'Transferability' […] is an imaginative process in which the reader of the research uses information about the particular instance that has been studied to arrive at a judgement about how far it would apply to other comparable instances. The question becomes 'To what extent could the findings be transferred to other instances?' rather than 'To what extent are the findings likely to exist in other instances?' (Denscombe, 2010, p. 301)

This paper does not argue that the same changes in sustainable practices will be found in other eco-developments; but that the transformative process of 'living-with' an eco-home is a useful lens which may be transferred to other instances.

To support interview findings, data were collected from documents such as newspaper reports, planning reports, planning applications and planning case folders which contained planning applications, drawings, notes on site visits by the planning case officer, minutes and decision notices from planning committee meetings, alongside letters of support and complaints from local residents and in some cases, national institutions. The data were analysed using the thematic analysis outlined by Opler (1945 cited in Ryan & Bernard, 2003, pp. 86–87). Coded data were not reduced to individual words, but instead considered sentences and paragraphs within the transcript of the entire interview in order to retain the discourse of the research participants. The aim was to produce a situated and contextualized analysis rather than an abstract understanding of values and meanings. The codes were grouped into themes based on the repetition of concepts present in the text. Some themes were clear and pervasive, appearing in several interviews—others were more subtle or only evident in one or two interviews; many themes were interrelated. A criticism of thematic analysis is that theme identification is likely to be specific to a particular researcher, which can disrupt the generalizability of the findings. As with ethnographical research, the normative position of the researcher is present at every stage of the project. Although it seems incongruent to make a case for the replicability of the data analysis process were the researcher to be replaced, this does not mitigate the possibility that findings may be transferable to other cases.

The following section presents the empirical data collected during fieldwork at ABMC. The contextual setting is introduced, along with a summary of the Millennium Communities programme. The policy context of the BRE EcoHomes is presented through the impressions of the architects of the eco-development; this

is followed by six sub-sections exploring inhabitants' experiences of the relationship of living-with others, living-with an eco-home. Stories of denial, frustration, exploration and transformation are revealed and the final section draws these narratives together and relates them to the theoretical approach introduced at the beginning of this paper.

Allerton Bywater Millennium Community

ABMC is in West Yorkshire in the north of England. Figure 2 shows the location of the county of West Yorkshire in the UK (inset), and within West Yorkshire the location of Allerton Bywater is highlighted with a red dot—note the proximity to the city of Leeds and easy access to major road networks—the M1 and the A1 (M) are major routes linking south to north, and the M62 links east to west, which made the new development of eco-homes attractive to commuters and those who travelled across large areas for work.

ABMC is a development of 520 terraced and semi-detached houses involving three mainstream speculative volume housebuilders. Using the categories developed by Smith (2005), the guiding principles of the development were profit and loss for the developer, and the desire of the Government, through English Partnerships, to stimulate volume housebuilders to develop new standard designs in preparation for forthcoming changes to Building Regulations and the introduction of the Code for Sustainable Homes (CLG, 2006). The impetus for the technological specification is largely driven by the industrial structure of speculative volume housebuilding where one fault on many dwellings leads to large liabilities. This led to the use of tried and tested technologies, grid supply of energy and water, and materials which were routine and could be purchased in bulk. The aesthetics of the site were brick terraced housing with variation in the façade treatment and internal layout—the scheme was designed for middle-income and working-class families who were thought to be passive and conservative consumers who would prefer this housing type which is traditional to the region (see Figure 3).
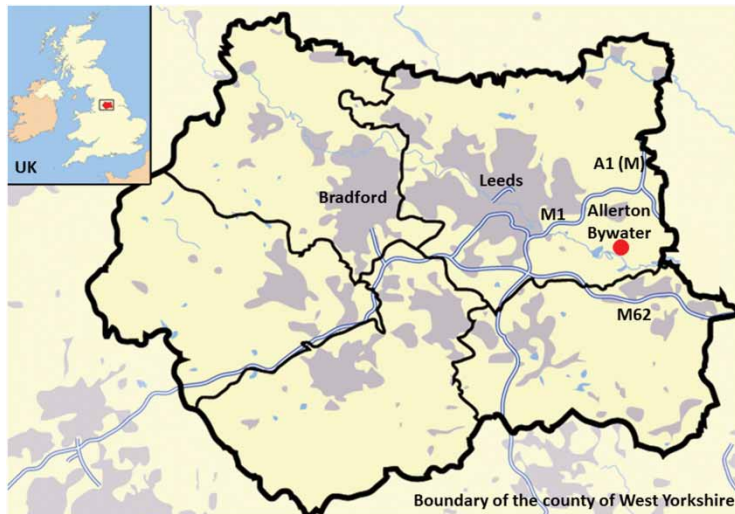
Figure 2. The location of ABMC.

Figure 3. The new brick terraced housing of the Miller Homes development (left and right) are a similar scale and material to existing brick terraced houses (centre).

The Millennium Communities are both a result of and a contributor to the recent changes in Building Regulations and the introduction of the Code for Sustainable Homes (Williams, 2008). ABMC was the second Millennium Community to be initiated after the Millennium Village at Greenwich, London. It was initiated with the following brief,

> In order to prove that mixed-use development is sustainable, it must be flexible and capable of working in any part of the country, not only in cities, but also in other urban and rural areas. (English Partnerships, 1998, p. 4)

There were numerous delays with ABMC partly due to strong local opposition to the high density of the development (English Partnerships, 1998) which would see the village increase from 1580 to over 2100 households (Akilade, 2000). Delays meant that five years after the original competition brief, no houses had been constructed. During fieldwork in 2007–2008, the development consisted of several

Figure 4. The Fleming-Fusion development.

Figure 5. Different building heights and materials were used to articulate the individuality of homes for the Miller Homes development.

phases of housing construction: the Fleming Fusion development (see Figure 4), the Barratts development, and the Miller Homes development (see Figure 5).

The Miller Homes scheme, which is the focus of this paper, mainly comprises brick and block, two-to three-storey terraced or semi-detached dwellings. There is an articulation of the individual dwellings with house fronts pushed forwards and backwards on plan to avoid a single straight line of properties (see Figure 5). The intention was to create the feel of a village with an assemblage of different façades, some of which include first floor bay windows with a timber finish. The 'green features' are better insulated walls, rainwater-collection butts, energy-efficient light bulbs and white goods.

The Architects' Impression of BRE EcoHomes

The architects for the Miller Homes scheme regularly worked with volume house-builders to develop large sites, but had no prior experience of designing eco-homes.

> We were working mainly with volume housebuilders who were just struggling to meet the minimum requirements of Building Regs [...] Eco-Homes bit was great fun because that meant that we all had to start thinking, researching, talking things through [...] we went through a tick box exercise and in so doing it was a series of compromises, checks and balances. So, for example, rainwater recycling through a water butt to go onto the garden—fine, but brown water recycling—they weren't ready for it yet, so that allocation was put to one side. Low energy light bulbs, high levels of insulation, correctly proportioned windows to ensure you get that little bit of extra daylight in the hope that you don't then turn the light on for another 10 minutes [...] I was slightly surprised that it wasn't as hard as I thought it would be to get EcoHomes 'Excellent'. That surprised me—which is either an implied criticism of the stringency [...] or perhaps I was maybe expecting too much. (Architect PRA1, (AB), PRA, 2008, 01/24)

While the architects were new to the EcoHomes rating, their conception of what made an 'eco-home' outstripped what was required by the assessment criteria. The choice of which points for the EcoHome rating to aim for seem to be based on cost and ease of adaptation of existing designs. During the interview, the architects were questioned about the changes they anticipated in inhabitants' lives:

> There's already some people who live there and they know how their house was conceived, they know it has a certain EcoHomes rating and some concept and standards that they're aiming for. Some of those people might well be reflecting that, in their own personal lives, and may well have done so had they bought a normal house down the road. Then you get to the other, far extreme where you get somebody who says 'This is my house. I've paid my money. I'm not going to faff about with these [light] bulbs. I don't like them and I'm going to change them.' I feel if you can present the opportunity then some will use it, but not everybody. (Architect PRA1, (AB), PRA, 2008, 01/24)

Sean and Tanya's Recycling Bin

Sean and Tanya previously lived five miles from Allerton Bywater and were one of the first residents to move in. Their former house had a large garden, was quite old and in need of modernization, which frustrated Sean and Tanya, so they decided to move. They were aware that the houses at ABMC were eco-homes. This was one factor that interested them in the development. They were also interested in making money through buying a property in the early stages of a new development, when properties are often discounted to incentivize people to move onto an unfinished site.

Prior to moving to ABMC, Sean and Tanya were beginning to adopt sustainable practices. They found that residing in an eco-home encouraged them to change their way of living.

> We've actually been much more thoughtful about what we do and what we can do, so I think when we moved in here we weren't as aware as we are now. And it was a factor in our decision definitely, but it wasn't the main one and we would probably have moved here anyway. (Tanya, (AB), inhabitant, 2007, 11/13)

One example that they gave of this is that they had wanted a compost bin at their previous property but had not installed one. At ABMC, the eco-homes are not provided with a compost bin, so they have made the effort to purchase and use one. Sean had previously recycled cardboard, paper, tin cans, glass and plastic containers. He was frustrated to discover that there was no recycling collection from his new 'eco-home' and therefore led a campaign to get recycling bins provided. Sean leafleted his neighbours and put posters up at the entrance to the site. Sean presumed that a development of 'eco-homes' would automatically have recycling collections. As a Millennium Community, the development should adhere to the Millennium Community Standards, one of which is to reduce domestic waste by 50%.

A misunderstanding between the housebuilders and the Local Authority led to this lack of recycling facilities. Miller Homes told Sean that they are only obliged to provide the sectioned bins in the kitchen cupboard whereas wheelie bins for recycling are to be provided by the Local Authority. Initially, the Local Authority stated that it was Miller Homes' responsibility to provide the wheelie bins, however after Sean's persistence it was agreed that the Local Authority would supply a recycling bin. Unfortunately this was not accompanied by a bin-collection service. Sean and Tanya pursued the matter and were assured the bins would be collected, so they dutifully put their bins out on the specified collection day. The bin was not collected. Seeing the bin alerted other inhabitants that they did not have one and so support for Sean's campaign to get recycling bins grew. The matter was resolved with the promise of recycling bins and a collection service a couple of months later.

Despite support from his neighbours in this campaign, Sean despaired at his neighbours' attitudes towards waste and recycling.

> I think that by their own admission the other guys in this estate [...] are sort of like, 'I don't really care.' They're not really bothered [...] as soon as the wheelie bin's emptied they forget about it and I think that's a big problem with landfill—is that we're all blissfully ignorant because quite often [...] you don't see these little landfill sites and, you know, we don't know about it, but when you think about it, it really disturbs, worries me. (Sean (AB), inhabitant, 2007, 11/13)

Other inhabitants mentioned issues about recycling. Pat was concerned with excess packaging in supermarkets. Ian and Jane were similarly frustrated at not initially having a recycling bin. However, no other inhabitants mentioned the impacts on landfill sites. The interview with Sean and Tanya highlights that some people will transform their daily practices and be inspired to live more sustainably as a result of living-with an 'eco-home'. Significantly, this couple also demonstrates that the assumption that inhabitants of developments by volume housebuilders are passive and conservative is misleading.

Following the crusade for recycling bins, Sean and Tanya became obsessed not just with generic recycling; but also with reuse: light fittings became vases, waste timber became raised beds for vegetable growing and fabric off-cuts became blinds for the windows. None of these activities can be directly attributed or determined from living-with an eco-home; however, it is unlikely to be coincidental that these passions arose after moving into their eco-homes. It seems that through the making of eco-homes, some inhabitants are transformed.

Pat's Dishwasher

Prior to moving to ABMC, Pat and her partner lived in a two-bedroomed property within six miles of Allerton Bywater and were looking for a larger place to start a family. Pat's initial motivation for moving was financial.

> I think if it hadn't been eco I'd have probably still bought it because of what you got for the money. However, I don't think I would have been as excited about it. I still go round telling everybody. If anyone says, 'oh, where do you live?'—'I live on this eco-friendly site'. (Pat, (AB), inhabitant, 2008, 01/10)

Pat framed her sustainable practices within the 'need to do your bit'/'little changes' discourse and was keen to tell others about the environmental credentials of her house. Pat's former employment at a planning consultancy which worked on a proposal for an eco-town probably influenced her greater awareness of the merits of ABMC.

Pat's frustration centred on the water butt which was provided by the developers.

> We've got the water butt and we kept that. It actually annoys me that some people have got rid of their water butt and put an outside tap on and I just think, 'why? Why have you moved to an eco-friendly estate and then got rid of the water butt?' I just don't quite understand that. (Pat, (AB), inhabitant, 2008, 01/10)

Whereas other inhabitants' primary frustration was aimed at the developers, Pat's frustration is directed to her neighbours. Reducing water usage has become a particular passion for Pat and influenced her decision to purchase a dishwasher. This was not straightforward as Pat had received contradictory advice. Pat rationalized that if dishwashers were good at reducing water consumption then the developer would encourage the usage of dishwashers; however no plumbing was provided for them at ABMC. Sean, Pat's neighbour, persuaded her that newer models of dishwashers use far less water than if she washed up by hand three times a day. The result is that Pat only uses the dishwasher every two to three days and is actually saving water. Pat would have liked grey water recycling and solar water panels for her eco-home and generally feels that the developers did not provide sufficient eco-technologies.

Micky's Underpass Lighting

Micky needed a new home after a relationship breakdown. He had previously lived in the local area, and Allerton Bywater was within six miles of his work base although he travels extensively across the county of Yorkshire for his job.

His sister had bought a property at ABMC and so he was familiar with the site. Micky's main motivations at the point of buying his 'eco-home' were that it was within budget and close to family and work, with good motorway links.

> I never really paid any attention to the fact that they were eco-friendly. [...] I didn't come to the house because it was an eco-house. It's probably safe to say it's started to change my opinion of things in that I'm becoming probably more conscious of different things about the environment. (Micky, (AB), inhabitant, 2008, 01/10)

Micky did not believe that an environmental catastrophe such as 'global warming' was imminent and was cynical of Government's motivations for perpetuating the 'myth of climate change', believing that it was a cover-up for political control of resources.

Micky's concern over energy usage led to frustration at the developers and conveyed his cynicism that the housebuilders actually care about environmental and resource issues. This example related to electrical lighting in the underpass between his 'eco-home' and his neighbour's 'eco-home'.

> I think that some of the things they've [the developers] done are quite good—the insulation, the fact that they've provided us certain facilities, but they've let us down in other areas. [...] They paid attention to the details of certain areas, but no attention to others. So, for example, the underpass—the light on the underpass at different phases of the build... My sister's still switches on. It's on permanent, on night and day, 24–7. [...] That's a complete waste of energy. The one on mine is a motion detector and it switches on when anyone ever walks underneath it, whether it's day or night. [...] Again—when it's not needed. There's not like 100% attention to making sure it's completely friendly with the environment basically. (Micky, (AB), inhabitant, 2008, 01/10)

Micky felt that his new 'eco-home' had made him more aware of his energy usage and his frustration at the underpass lighting may have heightened his awareness of his broader use of energy, leading to an exploration of routine practices in other areas of his home. Micky's drive to use less electricity led to the purchase of a piece of equipment which monitors the electricity supplied to each device and switches the device from standby to off to consume less electricity. Micky is also reluctant to continue using his kettle as when switched on, whether it is in use or not, it constantly has an LED light on. Although the amount of energy that this consumes is relatively small, to Micky it is symbolic of inefficiency.

In contrast to Micky, his sister Dawn had not altered her energy usage at all since moving, and she frequently left lights switched on and would have both a music player and the television on across the house without it being listened to or watched. Micky's increased awareness of energy use may be the result of receiving cheaper fuel bills due to the higher specification of insulation in the Miller Homes' eco-homes, or perhaps living-with the 'AAA' rated energy-efficient white goods that are installed in the properties by the developer. Micky's heightened awareness may be due to a perceived disjuncture between his former lifestyle and his new surroundings; it may be due to a sense of needing to comply or complement his 'eco-home'; he may feel empowered by his surroundings and realize that his day-to-day activities and choices affect the amount of electricity that he uses. Instead of a moralistic, awareness raising, educational pro-

gramme; the transformation of Micky's energy use may be the result of his experience of living-with his 'eco-home'.

Honey's Front Garden

Honey lives with her husband and their toddler. They moved to ABMC from a village three miles away because they wanted a bigger house but could not afford one in that village. Honey rationalized making 'little changes' in her behaviour due to the raised media profile of global warming. Honey's focus on 'little things' is indicative of a consumerist attitude. Honey is willing to make simple changes to her life which require little effort or thought into why or how she may change further. Honey is not an active inhabitant of her 'eco-home', which she described as 'the ready-meal of eco-housing'. One of Honey's main concerns was she regarded sustainable practices as at odds with her 'home comforts' although she thought her own eco-home was 'very nice'. In Honey's thinking, sustainable living was still regarded as an extreme position which she did not see herself fulfilling.

The main frustration for Honey was that in order to achieve a higher density, the developers reduced the external space for each house, so Honey's eco-home does not have a front garden. Honey described how she adjusted to this arrangement.

> At first I'd hated not having a proper front garden; not having a gate. You know, it was like your space, because at the old house we had a front garden, it was fenced, walled and a gate and it was nice and it took a lot of getting used to people just being able to walk by your front window. I used to be sat there thinking, 'What are you doing? You're in my front garden!', and then it was, 'oh, we haven't got one anymore.' But that took some getting used to, having no separate space. But it's just something you get used to. [...] We'd always had a front garden and getting used to not having one and someone being able to walk that close to your lounge window. (Honey, (AB), inhabitant, 2007, 11/12)

While Honey described her frustrations, she found the positive outcomes of not having a front garden. Previously when they washed their car it would be brought into the private space of the front garden with the gates closed—'you'd be in your space.' Now the car is washed on the street, which fosters conversations and relationships with neighbours.

Brad's Light Bulbs

Brad and his partner Stacey were first-time buyers. Their main concern when buying their house was to be close to their family who lived within eight miles of Allerton Bywater. Brad's job required a lot of travelling by car so the easy motorway access to ABMC was a key deciding factor. They were not particularly looking for an 'eco-home', their main concern was location. As first-time buyers, they were attracted by the marketing which stated that increased insulation in the walls of an eco-home would probably reduce heating costs. Financially, there was a limit to how much Brad was willing to pay for an 'eco-home'.

While much of the policy discourse presumes that 'living-with' an eco-home is a transformative process that will positively influence inhabitants to act more

sustainably, Brad provides a refreshing, if somewhat worrying, alternative. Generally Brad sought to undermine his 'eco-home'. While Brad's actions were not motivated by a desire to reduce the 'eco' credentials of his home, that was the effect of his actions. An example is Brad's reaction to the light fittings which were specified and installed by the housebuilder. The light fittings were only able to accept three pin energy-saving light bulbs—such fittings are primarily installed in order to assert benign control over inhabitants' choices and to ensure the longevity of the 'eco' credentials of the 'eco-home'. Unfortunately, Brad and Stacey disliked the aesthetics of these, preferring designer fittings which generally only 'looked nice' with light bulbs which were not designed for saving energy. Brad undertook the sizeable task of replacing all but one of the light fittings in his 'eco-home'. Brad was aware that his actions appeared almost perverse to those who take a more proactive environmental position.

> Does living in an eco-house—that I think was the brainchild of John Prescott's Millennium Village vision—make me want to fit those light bulbs? The answer is no. (Brad, (AB), inhabitant, 2007, 11/12)

Some of Brad's unwillingness to accept changes to his living arrangements may be due to his reticence to see his house as an 'eco-home'. Brad stated that he benefitted from the high levels of insulation, but he doubts that his house is an 'eco-home'.

> I don't think this is an eco-house [...] because it doesn't have any new technology in it and I was looking for that and that was the thing that really surprised me so it hasn't got some fangled new boiler, it hasn't got solar panels on the roof, it doesn't use geo-thermal power. I haven't even got a recycling bin. (Brad, (AB), inhabitant, 2007, 11/12)

For Brad, visible technology is synonymous with an 'eco-home', and he believed that the neighbouring scheme (see Figure 4) at ABMC is eco-housing because it has solar water heating panels on the roof. When it was suggested to Brad that his house achieved the same BRE EcoHomes rating as the other scheme, he made a discerning remark,

> Its perception isn't it? But perception's reality though, I guess, and if people perceive that [the other development] to be more eco-friendly, then that's going to attract that kind of buyer before this [development] ever will because these look like traditional houses. (Brad, (AB), inhabitant, 2007, 11/12)

As Brad's house lacks any perceivable features or technologies for it to be easily recognizable as an eco-home, it then perhaps becomes easier for him to not feel challenged to transform to live in a more sustainable way. The example of Brad and Stacy exposes the flaw in concepts of eco-rationalization (for further discussion of eco-rationalization refer to Hobson, 2002, 2003). Brad is aware of his energy consumption and how it relates to his electricity bill—yet that knowledge did not motivate him to retain the installed energy-saving light bulbs. Eco-benefits did not trump design and aesthetics—for inhabitants such as Brad and Stacey, sustainable products and practices have to be both useful and beautiful.

Other inhabitants also shared Brad's frustration at the energy-saving light bulbs—Pat had removed some of her light fittings and Ian and Jane were learning

to live with theirs. In contrast, Sean and Tanya found no problems with the light bulbs and became beneficiaries of Pat and Brad's unwanted light bulbs.

Ian and Jane's 'AAA'-Rated White Goods

Ian and Jane had lived at ABMC for 12 months at the time of interview. Ian and Jane wanted to live closer to family who live two miles from Allerton Bywater but in a village that is slightly more expensive to purchase property in than ABMC. The main thing that attracted them was the extra space that they could afford; they were not interested in the eco-credentials of the house at all. Ian and Jane claimed that they had not changed the way they live as a result of moving to ABMC, though they have kept the energy-saving light bulbs and use the 'AAA'-rated white goods which were fitted in the eco-home by the developer.

Ian and Jane's awareness of the energy efficiency of the white goods was through information provided by the sales team. Although aware of the environmental ratings, the motivating factor for Ian and Jane was the financial saving that they will make on the operational costs of the white goods. They would have considered buying the same house if it had also been supplied with other technologies such as grey water recycling as long as it would not have affected their lifestyle and if it would also save them money.

The specification of 'AAA'-rated white goods was a result of stipulations in the competition's brief for ABMC. While Ian and Jane had no particular frustrations with their white goods, Honey had a mixed impression of the 'AAA'-rated appliances. Having a young child, the washing machine frustrated Honey as it took more than twice as long to complete a cycle; however she appreciated the cheaper fuel bills. Ian, Jane, Pat and Honey all felt that most of the design interventions that made their home an 'eco-home' were easy add-ons such as the light fittings and 'AAA'-rated white goods—which could all be installed in any 'normal' home. Therefore they found it difficult to distinguish what was different about their 'eco-home'.

Key Findings and Conclusion

Analysing the stories of Sean and Tanya, Pat, Micky, Honey, Brad, and Ian and Jane together shows that any scripting in the design of the eco-homes is not strong enough to make all inhabitants think and act in a more sustainable way. While the developers of ABMC considered inhabitants to be passive recipients of their eco-homes, inhabitants have not just appropriated and used their eco-homes differently from the script, but have surpassed those expectations in an attempt to live up to the eco-home they are now 'living-with'. However, it is in the midst of their life experiences that the transformative process of living-with an eco-home enables each household to develop a way of integrating sustainability within their own set of values and meanings. Sometimes this leads to big changes, sometimes it leads to none.

The extent of change can be mapped onto the change curve (based upon Kubler-Ross, 2004 (1969)) (see Figure 6). Ian and Jane are in denial that there is anything different about their eco-home. Brad is frustrated by his eco-home and questions whether it is an eco-home (denial), but also changes the fittings of his eco-home—the light bulbs and light fittings in order to have designer fittings (frustration). Honey is exploring the changes to the site layout, such as not
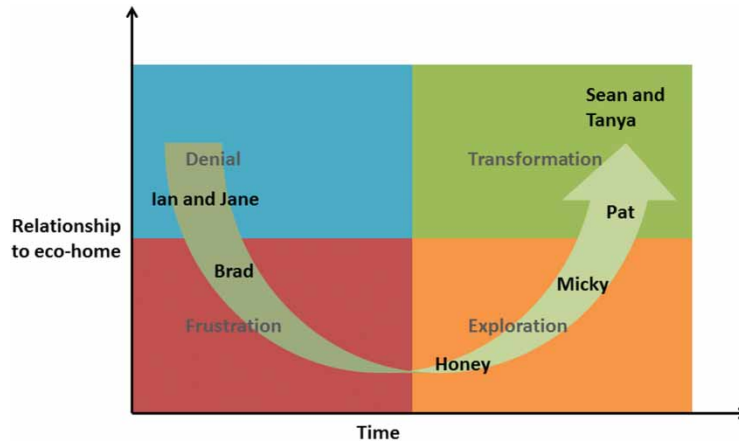
Figure 6. Mapping inhabitants trajectories on the change curve—based on Kubler-Ross (2004 (1969)).

having a front garden and finding positives such as increased opportunity to talk with neighbours. Micky has moved through frustration with the lighting in the underpass to explore other ways of reducing his use of electricity. Similar to Micky, Pat has moved from frustration with her water butt, through exploration of reducing her water usage and has become an evangelist for the merits of the development. Finally, Sean and Tanya have been frustrated by a lack of recycling facilities, explored recycling options and transformed not just their own recycling activities, but have also influenced their neighbours recycling and developed new and innovative ways of recycling and reusing objects as a result of 'living-with' their eco-home. It seems that such a model has been useful for mapping the experiences of these eco-inhabitants in this particular eco-development. However, more work is needed to see if the concept of 'living-with' and the model of the process of change are relevant for other eco-developments in other international contexts.

As well as living-with the eco-home, this paper also addresses the social dynamics of living-with others, living-with an eco-home. These can be characterized as the 'good neighbours'—epitomized by Sean and Tanya's enthusiasm, which leads them to educating their neighbours about recycling, water usage and lighting. Or the 'bad neighbours'—such as Brad, who is unwilling to conform to expected environmentally friendly behaviour. While the social dynamics are introduced here, further research is needed to ascertain whether competitive attitudes and judgemental approach, as seen in the example of Sean and Tanya, actually assist or hinder long-term relationships between eco-inhabitants and the resulting eco-credentials of the eco-development.

Planners, designers, architects and masterplanners have a significant role in the making of 'eco-homes'—especially as the eco-home transforms from a grassroots phenomenon built by eco-idealists into mainstream housing supply, thus affecting the lives of ordinary people living in new speculative housing estates developed by volume housebuilders. Ian and Jane were the least eco-aware couple that were interviewed at ABMC, yet their lack of prior eco-knowledge does not prevent them, or hold them back from accepting more overt eco-technologies. This is a challenge to volume housebuilders who frequently state that they build what the consumer wants. The Future Homes Commission (Banham *et al.*,

2012) has recommended that new build housing in Britain should increase three-fold—from 100,000 completions to 300,000 completions per year—this should be seen not just as an opportunity to build more sustainable eco-homes, but as an opportunity to transform the values and practices of inhabitants living-with these new eco-homes.

While this paper argues that living-with others, living-with an 'eco-home' leads inhabitants of new eco-developments through a process of change from frustration to transformation in their values, meanings and practices, this is largely based on a short period of fieldwork. To further understand whether inhabitants such as Ian and Jane or Brad migrate from denial and frustration towards exploration and transformation, it will be important to conduct a follow-up study and reflect upon the findings presented in this paper.

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20   *L. Jones*

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