Energy Research & Social Science 55 (2019) 227–235

Contents lists available at ScienceDirect

Energy Research & Social Science

journal homepage: www.elsevier.com/locate/erss

Energy poverty and social relations: A capabilities approach

Lucie Middlemiss*, Pepa Ambrosio-Albalá, Nick Emmel, Ross Gillard, Jan Gilbertson, Tom Hargreaves, Caroline Mullen, Tony Ryan, Carolyn Snell, Angela Tod

Sustainability Research Institute, School of Earth and Environment, University of Leeds, Leeds, LS2 9JT, United Kingdom

ARTICLE INFO

Keywords:
Energy poverty
Social relations
Capabilities
Secondary qualitative data analysis

ABSTRACT

Energy poverty is widely understood to be a complex and multi-faceted problem, with a range of drivers. In this paper we draw on secondary qualitative data on energy poverty from the UK, as well as conceptual thinking informed by the capabilities approach, to explore a previously understudied facet of energy poverty: social relations. We focus particularly on how relationships with family, friends, agencies and distant others impact on people's ability to cope with energy poverty. We find that the connection between social relations and energy poverty is recursive: good social relations can both enable access to energy services, and be a product of such access. This connection is also shaped by structural factors, such as access to a range of resources, membership of particular collectivities, the need to perform social roles, and the common reasons used to explain poverty and energy use. Our work suggests that attempts to address energy poverty need to take into account the quality of people's social relations, as well as the potential impact of policy and practice on social relations, given that people rely on their friends and families for information support and advice, on key agency workers for access to resources, and are also constrained by discourses of poverty.

1. Introduction

Energy poverty[1] is widely understood to mean the inability of households to access adequate energy services, including home heating, electrical appliance use and mobility [1]. Recent writing on energy poverty argues that this is a complex and multi-faceted problem, one that has a range of drivers, and can result in multiple forms of vulnerability [2–7]. There is an emerging literature on the lived experience of energy poverty, which documents the daily lives of those unable to access energy services from a variety of disciplinary perspectives (highlights include [3,8–18]). This literature also tends to find that vulnerability to energy poverty is complex and systemic: not merely a function of people's life circumstances (for instance being poor, being older, having a disability, having small children) but a function of a complex intersection of life circumstances, social circumstances, availability of infrastructure, and the political climate.

To date, energy poor households are commonly understood as suffering high fuel bills, low incomes, and poorly insulated dwellings [19] as well as lack of access (through mobility) to services, employment and education [20]. In addition, there is a strong and recognised connection between a households' energy poverty status and its members health, both physical and mental [21–23]. Social relations[2] inside and outside of energy poor households have had minimal attention [3,24], despite a growing recognition that loneliness can exacerbate the experience of living in poverty, and that being well connected to others can be beneficial [25,26]. In addition there is evidence within poverty studies that stigma (a form of social relation) is hugely important in structuring people's responses to their own, and others' poverty [27,28].

This paper emerged out of a project in which a large interdisciplinary team, most of whom are energy poverty researchers, worked together to develop theory in conversation with secondary data. We build here on a capabilities approach to characterise how

* Corresponding author.
E-mail address: l.k.middlemiss@leeds.ac.uk (L. Middlemiss).

[1] Note that we use the term 'energy poverty' in line with European convention (not the British 'fuel poverty'), and in order to reflect the focus on access to all energy services including mobility.

[2] For clarity, and before we enter into deeper discussions of the capabilities literature which has helped us to elaborate this term, we use the term 'social relations' to refer to the relationships that people experiencing energy poverty have, including: relationships with other members of the household, relationships with friends and family outside the home, relationships with agencies that have an input to household life (e.g. social services, health professionals, educational institutions, energy advice services, landlords), more abstract relationships relating to people's sense of belonging in society (class, gender, place). We bundle this wide variety of relationships together in this paper, because we wish to show how all of these have a role in structuring people's ability to cope with energy poverty, and how these different kinds of relationships are interwoven in people's daily life experiences.

https://doi.org/10.1016/j.erss.2019.05.002
Received 18 September 2018; Received in revised form 29 April 2019; Accepted 2 May 2019

people's social relations impact on the complex and multi-faceted experience of energy poverty in the UK (see [4]). Sampling from a large number of secondary qualitative interviews (197), gathered by multiple primary researchers between 2003 and 2016, we explain how people's social relations capabilities impact on their capability to access energy services, and vice versa. We begin the paper by characterising the links between social relations and energy poverty using a capabilities approach. We then outline the analytical approach we took to a large collection of secondary qualitative data, as well as explaining what this data entails. We show how the connection between energy poverty and social relations plays out in our interpretation of the data we are working with, giving three accounts of this connection in practice. We finish by offering a conceptual framework to summarise our thinking, and recommending future directions.

Our main contribution here, is to elaborate the connection between two sets of capabilities: capability to engage in social relations and capability to access energy services. In doing so, we find that the connection between capability to engage in social relations and capability to access to energy services is bi-directional, and shaped by a number of other structural factors (access to resources, membership of particular collectivities, the need to perform particular social roles, and common explanations of poverty and energy). Our research suggests that it is helpful to conceive of energy poverty using a capabilities approach, particularly because focusing on people's capabilities to access energy services helps us understand both the opportunities for agency, and the structural barriers to this. Our work also suggests that social relations should be given more attention in policy and practice.

2. Capabilities, social relations and energy poverty

We begin by bringing together concepts from the capabilities approach to explain the connection between energy poverty and social relations. We use a capabilities approach to elaborate the idea of social relations, to explain the connections between social relations and access to energy services, and characterise the social conditions which lead to this connection. Many readers will be familiar with the capabilities approach, which is widely used in studies of poverty, and increasingly referenced in this journal. By way of introduction, the capabilities approach emerged as a socially rich response to the tendency to measure progress in development using Gross Domestic Product [29]. The argument, made by Nussbaum and Sen, is that to truly understand development we must see how it expands people's capabilities to achieve wellbeing, rather than merely how much money they make [29]. This requires developing a richer picture of people's lives, understanding how personal, social and environmental barriers might prevent them from achieving capabilities. Readers unfamiliar with this approach are advised to seek more comprehensive introductions [30], and to read key texts [29,31,32].

We draw on a capabilities approach for a number of reasons. First, this allows us to build on existing work which has found energy poverty to be complex and multi-faceted. At the heart of a capabilities approach is an appreciation of the diversity of human needs and desires, and the resulting diversity of functionings that capabilities might give rise to. Second, it allows us to avoid a deficit-based account of vulnerability to energy poverty: an account which would emphasise how vulnerability is held in particular social categories [33]. In energy poverty policy, it is common to turn to such a deficit-based account, highlighting older people, people with disabilities and small children as 'vulnerable', for instance [34]. This fails to capture the complexity and multi-faceted nature of the experience of energy poverty. Finally, we show social relations (albeit not labelled as such) to be a central interest in the capabilities approach, allowing us to build a conceptual framework based on concepts that are congruent. This last point is where we start this section, by elaborating social relations through a capability approach.

2.1. Elaborating social relations through a capability approach

Our specific interest in this paper is in investigating the links between social relations and people's ability to access energy services. To date this topic is both under-researched and under-theorised in the literature on energy poverty [3,24]. In the capabilities literature, however, social relations are a key interest. Nussbaum's 'central capability' of 'affiliation', maps clearly onto our understanding of social relations. This has two dimensions:

> "(A) Being able to live with and toward others, to recognise and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.) (B) Having the social bases of self-respect and nonhumiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of nondiscrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin." (2011, 34)

In other words, we need to be able to affiliate with others in a day-to-day sense (A), but also to have both self-respect and dignity in the context of more abstract social relationships (B) and the ability to participate in collective political processes (as in A: freedom of assembly and political speech). This is also mirrored in Sen's understanding of the social elements of a capabilities approach, which consist of:

> "concern with the **capability to take part in the life of the community** (or the more specific **capability to appear in public without shame**) and the **causal factors that are seen as influencing such capabilities**" (2000, 8, our emphasis)

Nussbaum's "collective political processes", and Sen's "taking part in the life of the community" are important here: they go beyond conceiving of social relations as the direct relationships people have with others, to conceiving of these as a form of agency through relationships, and agency that could impact on social institutions. The agency of the energy poor is not a topic that has attracted much discussion to date: the energy poor are more often portrayed as rather trapped by structure. Note also that Sen's 'causal factors', points to another relationship: between the individual's capabilities to engage in social relations, and that individual's social context, or his/her position in relation to others in society [35]. This would suggest, for instance, that we need to protect 'the institutions that constitute and nourish such forms of affiliation' ([36], 34).

Taking Sen and Nussbaum's work together here, we identify three forms of capability: the **capability to have meaningful relationships**, the **capability to have dignity**, and the **capability to participate in society**; all of which have to be considered in the **context** that enable such action[3] . A description of each of these capabilities is included in Table 1. Note that the social relations capabilities listed here, exist in a broader **context** which is also frequently formed of social relations (beyond the individual), and which we discuss in more detail below. First though, we need to consider how the connection between social relations and energy poverty could be explained though a capabilities

[3] Smith and Seward break down social relations into 'collective action, institutions and social capital' which, we argue, is less useful than the categories we distilled from Nussbaum and Sen above: the capability to make relationships, the capability to have dignity, and the capability to participate in society. If we were to use the concept of social capital, the notions of 'bonding' and 'bridging' would have to stand in for our more nuanced interpretation of the quality and nature of people's relationships with each other. Fine also suggests we drop the term in preference for a critical social theory of the economic, social, political, cultural, and material that constitute the relation between collective action and institutions (or agency and structure) [48].

Table 1
Three social relations capabilities.

Social relations capability	Description
Capability to have meaningful relationships	People are able to make and maintain good connections with others in the household; family and friends; key agencies and abstract others.
Capability to have dignity	People do not feel shame, and have confidence in their social position
Capability to participate in society	People have opportunities to shape social institutions.

approach.

2.2. Explaining energy poverty using a capabilities approach

There is precedent for drawing on a capabilities approach in the field of energy poverty [4]. Day et al. argue that "consumption of energy services should be understood as linked to the quest for certain capabilities" (2016, 259), defining energy poverty as:

> "an inability to realise essential capabilities[4] as a direct or indirect result of insufficient access to affordable, reliable and safe energy services, and taking into account available reasonable alternative means of realising these capabilities." (2016, 260)

Day et al. make a helpful distinction between different forms of capability (2016). First, they follow Sen's distinction between functionings and capabilities: functionings are the 'beings' (for e.g. good health) and 'doings' (for e.g. heating one's home adequately); capabilities are the opportunities to realise such functionings [37]. They also draw on Smith and Seward to talk about relationships between capabilities, including the function of one set of capabilities to serve another (2009).

Day et al. propose a sequential relationship between 'domestic energy services', 'secondary capabilities' (e.g. being able to wash clothes or keep warm) and 'basic capabilities' (which incidentally includes 'maintaining relationships'), noting that the secondary capabilities are the area that tends to be the focus of analysis [37]. Note that such a sequential relationship implies that basic capabilities are served by secondary capabilities, and not the reverse. Day et al. hint at the structural drivers of the relationship between basic and secondary capabilities: specifically pointing to household characteristics (size, individual's needs etc), and practices in the home that use energy, and environmental conditions (especially climate). They also touch on the relationship between social relations and accessing energy services.

While we appreciate the work done by Day et al. in bringing together these concepts, we argue that a sequential representation of the relationship between energy services and capabilities is not adequate to capture the nature of influence here. As we will show, the relationship between capability to access energy services and social relations capabilities (which Day et al. would argue is a basic capability) is at least bidirectional, or more likely forming a more complex web of relationships, shaped by a number of social factors (detailed below). Indeed, it is unhelpful to characterise the capabilities associated with social relations as either 'basic' or 'secondary'. Social relations might be both an end in themselves, in that you might want the capability to achieve a desired form of social relations (a 'basic' capability), as well as a means by which other ends could be achieved, in that you might need good relationships in order to achieve further capabilities (a 'secondary' capability). In a sense they amount to both structure and agency (in the form of capabilities). Indeed Sen claims that:

> "Social exclusion can, thus, be constitutively a part of **capability deprivation** as well as instrumentally a **cause of diverse capability failures**" ([38], 5, our emphasis)

In other words someone can experience deprivation because they are unable to engage in meaningful social relations, but they can also experience deprivation because their social exclusion prevented them from enacting other capabilities. This blurring between basic and secondary capabilities, and between social relations as agency and structure, supports our argument against a sequential understanding of the relationship between energy services and capabilities, suggesting a more complex set of influences.

2.3. Putting social relations in context

So far we have characterised the nature of the capabilities associated with social relations, drawing on the capabilities literature to list the three social relations capabilities summarised in Table 1. We have also argued that capabilities associated with social relations and access to energy services have a more complex relationship than the sequential one posited by Day et al. One piece of the puzzle is still missing, however. Before we discuss our empirical material, we must elaborate on the concepts which allow us to explain the broader social context, or the conditions that shape both capabilities and the links between them.

To this end, we turn back to the capabilities literature. Here, social conditions are to some extent represented in the concept of 'conversion factors': the personal, social and environmental factors which shape people's capabilities [30]. These help us to make the link between the broader social conditions and the presence of capabilities. For example, someone can only have the capability to ride a bike when they have the physical ability (personal), when this is an accepted behaviour for them (social) and when the infrastructure exists to support cycling (environment). This is still rather limiting, however, given that it essentially allows us to describe the mechanisms that enable capabilities to be achieved, rather than the richer social context in which they occur.

In a more recent contribution, Smith and Seward [35], use a realist understanding of causality to further elaborate the concepts of social structure which help to explain how capabilities occur. They argue that research must give:

> "a description of how particular social structures provide the **reasons** and **resources** for the realization of the particular capability. Identification of the causal powers of the social structures comes through an understanding of the individual's position in a **role** or **collectivity**, and how that position shapes their life chances, powers, and liabilities." (2009, 225-6, emphasis our own)

Four new concepts are introduced here (highlighted in bold) which specifically help us to characterise the social factors impacting on capability to engage in social relations and to access to energy services. While these four concepts are only briefly explained by Smith and Seward, we have found them particularly useful in analysis, given that they aim to explain what constrains or enables people's capabilities. Table 2 presents our summary of these concepts in relation to energy poverty, drawing both on Smith and Seward, and on other authors working in the realist tradition (especially Archer [39]). We divide these concepts, after Smith and Seward, into those that relate to the social conditions in which the person finds themselves (reasons and resources), and those that relate to the specific social position that the person holds (roles and collectivities). Note that all of these concepts are forms of social relation in themselves.

[4] Note that for a discussion of what constitutes an essential or non-essential capability, refer to Day et al.

Table 2
Social context (conditions and positions) which shapes social relations capabilities and capability to access to energy services.

Social conditions	Description
Reasons	*Justifications or explanations for social phenomena.* Ways in which a range of actors (including energy poor, and actors in the public domain) make sense of energy poverty, energy in everyday life and poverty.
Resources	*People's material and social circumstances.* A wide range of factors have an impact, including: dwelling insulation and appliance efficiency; mobility system efficiency and mode; financial resources; social relations; fair energy/fuel prices; health or disability status.
Social positions	**Description**
Roles	*The specific roles that people perform in society (with associated powers and liabilities).* Here we consider how roles such as 'tenant', 'employee', 'mother' or 'son' intersect with people's ability to access energy services.
Collectivities	*Groups that share the same life chances to which the household members belong, and that have access to similar resources.* Some collectivities are widely recognised as bearing a larger share of energy poverty due to the distribution of resources in society. We use collectivities to represent both the real differences in distribution of resources (whether by the state/companies or by life stage/position) as well as the ways in which types of people are seen and treated by others.

2.4. Risks and opportunities in taking forward a capabilities approach

We would not want to proceed in this work, without considering the critiques of a capabilities approach, and therefore the risks of using this framework to study energy poverty. There are two important potential criticisms here. First, there is a risk of seeing social relations as merely instrumental, in this case as a means of achieving access to energy services, rather than as a fundamental way in which society is constituted [40]. Smith and Seward's elaboration of social context outlined above helps to counteract this to some extent, although we remain cautious in a field (energy studies) in which the social world is frequently characterised in very instrumental terms. Second, our focus on social relations also risks individualising the problem of energy poverty: seeing it as a function of a person's capability to maintain social relations, rather than as a more structural problem that stems from entrenched inequalities and ongoing debates about the distribution of resources [41]. We are alert to the potential for both of these risks, and attempt to account for them in our use of this framework.

It is clear from our theoretical work, however, that there is mileage in building on a capabilities approach to explain the links between social relations and energy poverty. Our work also expands current thinking about energy poverty that uses a capabilities approach [4], to propose a bidirectional and socially systemic understanding of the connection between social relations and energy poverty. We will now move on to our analytical work: we proceed by outlining the analytical approach to our secondary data sources, and then by presenting our analysis of the data we examined. We will return to the theoretical concepts in the discussion.

3. Analytical approach

In analysis we sought to explain the connection between access to adequate energy services and social relations capabilities, as well as the impact of the broader social context on people's capacity to engage in social relations. To do this we used an abductive and retroductive approach, zig zagging back and forth between theory and data to offer both theoretically sound and grounded explanations [42]. This research was a secondary qualitative data analysis project, and as such data for analysis were chosen from 8 existing primary data sets. Selection of the data sets themselves, and the specific interviews for analysis, was based on team members' judgements as to the availability of relevant data for the topic of social relations. The data available for analysis (listed in full in the data in brief comprised of 197 qualitative interviews, conducted between 2003 and 2016 in a wide variety of locations around the UK with members of households known to be experiencing some form of energy poverty. The topic of social relations was not dealt with directly in any of the interviews, apart from in the final study which offered some primary data on this topic. Inevitably this may mean that interviewees would have said more, or different things about their relationships had they been questioned directly. Within the larger data set, we sampled purposefully and theoretically [42], choosing 12 cases (interviews) in which our participants were either very well connected, or socially isolated. We aimed here to capture a diversity of experience.

We analysed interviews by combining thematic and narrative analysis and with an eye on the secondary qualitative data analysis literature [43–45]. While the coding and analysis was conducted by the two lead authors, the rest of the team had a critical input into designing the analytical approach, sampling frame, research questions and theory development. Given that we were attempting to elaborate a set of concepts which relate to process (the ways in which social relations capabilities result in ability to access energy services, and vice versa), we analysed transcripts using a narrative approach. This helped us to understand more comprehensively how interviewees experience energy poverty and how this connects to their relationships with others, as well as giving deeper context to that experience. Indeed, only by delving into specific cases could we get a sense of how social structures create the conditions for capabilities. Below we have presented our analysis in the form of three accounts to demonstrate the diverse ways in which people's social relations impact on their access to energy services and vice versa. The three chosen accounts are broadly representative of the data set, in the sense that we recognise many aspects of the experiences of these interviewees as common across the data. These accounts also helped us to develop the conceptual framework presented in the discussion below

4. Accounts of social relations

Here we present three accounts from our data which bring our theorising into conversation with empirical evidence. These exemplify how social relations capabilities influence people's capability to access energy services, and how access to energy services constrains and limits the capability to maintain satisfactory social relations. Each account profiles one interviewee, their experience of energy poverty, and insights into their social relations gleaned from secondary data analysis. Note that these are taken from interviews with individuals, but the stories that emerge document the experience of the household and the wider social network. Each of the stories is followed by a brief discussion of its relevance to the theoretical concepts outlined above. Note also that all of the individuals profiled here are female. This is not a coincidence: women in the UK are more likely to experience poverty, and as such there are more interviews with women in our data set.[5]

[5] A deeper discussion of the importance of gender in energy poverty in the global North is long overdue.

4.1. Marina's story

Marina is in her late 40 s and lives with her husband and two children. They own their own house but also receive benefits as they are on low incomes. Marina has a physical disability, is very immobile, and is often at home, and as such warmth is particularly important to her. Marina's husband is her carer. Marina is not originally from the UK, which is evident in her spoken English, and was interviewed in 2003.

Until recently their home was not a comfortable place. For about two years, they only had access to hot water if they had the heating on, even in the summer. Marina suffered from having a cold house in the winter; she would have liked to have the heating on for longer to stay warm. In the winter the children could not use their own bedrooms because they were too cold. Marina expressed concerns about exposing her children to the cold.

Marina and her husband decided to improve the energy efficiency of their house by fitting double glazing and looking for further government support. Investing in energy efficiency was a challenge for the family given their low income. Because of the condition of their home and her health condition, Marina qualified for the Warm Front scheme: an energy efficiency subsidy available in England at the time that gave access to a new boiler and cavity insulation. Marina took the lead in applying for funding and grants.

Marina and her husband had to fight hard to access this scheme, which took about two years. This was partly because of issues associated with funding availability and changes to the tenure eligibility criteria of the scheme during the period she was applying for it, which were not clearly articulated to Marina by service providers. Marina experienced this as an intensive bureaucratic process, which led to emotional and psychological consequences. To access the scheme and have the work done effectively, Marina had to deal with a number of different people (boiler installer, engineers, workers, and customer service staff) none of whom had a comprehensive understanding of her situation or were able to take the lead on her case. Marina and her husband felt isolated because nobody was able to give a reason as to why a decision on their eligibility for the scheme took so long. This had substantial consequences for Marina's health. During this time the family faced a number of additional challenges, including having to turn the heating off because of the noise of their faulty boiler.

Every time Marina tried to chase up suppliers, she would feel anxious and stressed. This led to her feeling that she could not interact with those in charge. Marina felt she was claiming for something she was not entitled to: that she was begging. Those who were there to help Marina made her feel unable to articulate her ideas and problems in "proper" English and as a result she was not able to make herself understood. She complained about the lack of respect in the tone of those at the other end of the phone. In her own words:

> "It was like… the tone of voice that people was talking to you, like as if I'm being a pest, and because I've rang them a few times, it's like, every time before I get on the phone I could feel my blood pressure going up and my adrenaline was pumping and I sort of, have an idea what they're going to say to me and I know that … I'm just ringing them to let them know I'm still waiting, that's all, and even then I felt like, you know… 'but there's so many like you …, you know', and I… if there's a lot like me, you need to look at your resources!"

For a long time, the challenges that Marina and her husband faced put them off asking for help. Eventually they contacted their MP, whose intervention and contacts resulted in a swifter resolution. Marina describes this:

> "… we were trying to cope with our own situation and it made us feel more isolated until I got in touch with our MP … I think in the end the last ditch was the MP. I think if she couldn't have helped us we would have given up. Because you are dealing with a bureaucracy and you can only do so much".

They also contacted the Citizens Advice Bureau (CAB) which helped them to chase funders to make a decision. When they finally had the work done and had access to a warmer house, this was a massive relief, as well as having substantial physical health benefits for the family and positively influencing the social life within their household.

> "I think it makes you feel comfortable to live in your house as you wish, and if you are sitting down, you're not walking around, you are sitting down in one place, you are able to do that without feeling discomfort. So it is a big improvement from that point of view (…) Yes, since we've had the insulation and all that, the kids have stayed upstairs more…Yes, they stay in their rooms more so that everybody has a bit of space".

If we analyse Marina's story through our theoretical lens, we find that her *capability to access social relations* and her *capability to participate in society* clearly impacted on her *ability to access to energy services*. The energy efficiency service provider's perceived response to her foreign accent represented a challenge to her accessing energy services: the implication here was that she does not understand, is not deserving or is not worthy of respect because she belongs to a specific *collectivity* (immigrants). This both discouraged Marina from asking for help and impeded her *capability for dignity* in this. Even though this did not, in the end, prevent Marina from accessing the help that she needed, it certainly made the process of finding help painful. Prejudice against immigrants is one of the *social conditions* that shapes Marina's ability to access help. The disjointed nature of grant provision is also a challenge for Marina: the *resources* available are not always clearly advertised or understood, either by her or by the agencies delivering them. In Marina's case, this led to further challenges and contributed to the questions of eligibility arising in her mind and for service providers.

In Marina's story we can also see examples of the *bidirectional relationship* between social relations and energy services. Her family's social life in the home is impacted by the cold, when children cannot access their own space in the winter. Marina's use of her MP and CAB as intermediaries to access energy services is something we see very often in our data: Marina understands that while she is not powerful in herself, she can engage others to exercise power on her behalf.

4.2. Alice's story

Alice is a single mum with arthritis in her mid-40s, interviewed in 2010. She has four children and is currently unemployed, so she is dependent on Child Benefits and her Disability Living Allowance. She is the carer for two of her children who have serious health issues, and she is also studying to be a Teaching Assistant. She lives in a social housing estate which she moved to with her mixed-race family, after experiencing racist abuse elsewhere. Although she has experienced some crime, she is happier in her current home.

Alice uses a prepayment meter for gas and electricity, and she needs to top it up quite often. She has recently changed her energy supplier in search of a better deal. She is aware of the cost of leaving electrical appliances turned on, but she struggles to get her children to comply. She is worried about the cost of energy during winter because the house is not well insulated, and her bills increase during that time of the year. She knows that her family's energy use has an impact on the environment, partly because her youngest child brings home environmental ideas from school.

Alice is unable to keep her house warm in the winter and cool in the summer the way she would like to. This means she spends a lot of money on gas and electricity, and she has had to change her lifestyle to adapt to this situation. In wintertime, the family goes to bed earlier, and she turns the heating off; but when they wake up in the morning the house is not warm enough. They often sit under a quilt in bed and watch TV together on winter evenings to save money. In the summer,

Alice does not use the tumble drier. As is typical of the parents we talk to, Alice expresses intense concern about her children's exposure to heat and cold in the home. She lets her children use the fan in summer more than she uses it herself, so they can better cope with their skin and breathing conditions.

The housing association has done some work in Alice's house: installing a new heating system, kitchen and bathroom. However, she has some unresolved issues, including extensive damp and the single-glazed windows upstairs that affect her family. In particular, the issues with the house affect Alice's ability to meet her family members' needs. She will soon have a granddaughter and she is worried that the damp will not be sorted out before then. She is waiting for the housing association to fix it. The damp has been a recurrent issue in the house, and although contractors treated it the damp is still present.

She has mixed feelings about the housing association. There is no housing manager anymore, so it is more difficult for her to ask for help if anything needs repairing in her house, or to know when these things will be sorted out.

> "I think they're still finding their way. I think their attitude on the phone could be a lot better, I think when they make promises or agreements that they're going to come out and do things, they should do them. They have done a good thing; they've improved our home with new heating, kitchens, bathrooms, because nothing was done for so many years, and everyone, well most people have got damp and everything. I've got damp and they've not done that so until they've done that I'm not going to sing their praises. They keep letting me down with that, but apart from that, they are still finding their feet, I think."

Alice's ability to *access adequate energy services*, and her family's health, have been constrained by the inadequate nature of the building fabric of her home, which remains damp and too cold in winter (inadequate *resources*). This restricted access to energy services has an impact on both the way the family must live their lives together within their home (e.g. watching TV together in bed in winter: her *capability to maintain social relations*) and her perceived ability to satisfactorily perform her *role* as mother and future grandmother within the household. This has been further aggravated by the slow and ineffective response of her housing association to these problems (inadequate social *resources*).

Despite the departure of the housing manager, Alice is able to chase the housing association about the problems she is experiencing, and sees herself as engaging in a project with them: as she says, she will not 'sing their praises' until they resolve all her problems. Alice is attempting to shape the way that the housing association responds to her, commenting on their phone manner and the way that they communicate. She has a clear understanding of what the service they provide should be like, and sees her own interventions as a way of shaping that service, despite her limited success to date (*capability to participate in society*).

4.3. Marie's story

Marie (interviewed in 2013) is an older person, living alone in her detached bungalow, to which she moved when her husband needed specialised medical care, before he died. She has a daughter locally, and a grandson and very ill granddaughter. Since Marie broke her hip, she suffers from swollen legs. Her health condition is fragile; she also suffers from pancreatitis and septicaemia. She spends most of her time at home and her social life has been reduced to visits from family members. Marie's daughter is a big support: Marie depends on her to run essential daily life errands, including shopping for food. Marie has no cleaners or carers. A month before this interview, she started to go to a carers group. She would like to go out more often, but she needs the help of her daughter. Her daughter also takes her to hospital appointments. Her daughter cannot visit as often as she would like to due to her job and her own child's health condition.

For many years Marie had a contact in the Home Improvement Agency[6] with whom she had regular contact because of her husband's conditions. This contact had an important role, making improvements in the house, improving safety, adding insulation, putting foil behind newly fitted radiators. Now that she has lost touch with this contact, Marie is not aware of what other support she may be entitled to. Marie cannot really tell if she saw any benefits from the renovations. The new radiators did not work well, and her energy bills have not reduced. She has the same routines as she used to have before the renovation. She has also paid for further work around her home, including hiring a plumber to check the faulty radiators and having a ceiling fixed. She did have some savings to pay for this work, but these have decreased considerably with the cost of refurbishments. Marie struggles to organise these changes on her own; as for many other things, she needs the help of somebody else, usually her daughter.

Marie used to pay her energy bills through direct debit. At the moment she can afford to pay them but this is at the expense of not using the telephone. Not using the telephone means she is cut off from her daughter. She is worried about paying bills on time, because of her conditions, and because she depends on her daughter to post the cheques.

Marie's story shows how the *capability to make and maintain social relations* throughout time can be essential in her ability to *access to energy services*. Indeed, her ability to access energy services depends heavily on her daughter acting as an intermediary: whether to organise renovations or to communicate with the energy company. In the past she had another intermediary from the Home Improvement Agency, who helped her secure funding and improvements. In both these cases Marie uses her social relations as a *resource*, enabling access to energy services. The fact that Marie lives alone, is in ill-health, is an older person, and relatively recently bereaved (all *collectivities* that result in a specific pattern of access to resources) in this case make it challenging for her to access new support: her current reliance on her daughter is restrictive.

Marie had to make compromises if she wanted to be able to pay for her energy bills (due to lack of financial *resources*); these compromises, principally not using the telephone, result in her having less contact with her family. Here, Marie is having to reduce the frequency of her contact with social relations in order to access adequate energy services, emphasising the constitutive and instrumental nature of social exclusion discussed earlier. Marie's limited financial resources, and limited ability to act for herself mean that she is both more reliant on social relations for support, and more isolated. She reports that this isolation also impacts on her mental wellbeing.

5. Building a systemic model of energy poverty and social relations

We chose these three accounts purposively and theoretically [42] to demonstrate the range of connections between energy poverty and social relations. In analysing the data we had in mind our three characterisations of social relations capabilities: the *capability to have relationships*, the *capability to have dignity*, and the *capability to participate in society*; the *bidirectional relationship* of these capabilities with the ability to access energy services; as well as the need to understand capabilities in *social context*.

One of the striking features of these three accounts is the interconnectedness between people's social relations and their ability to access adequate energy services. Whether it is people's access to powerful intermediaries (local MP, Housing officers, Home Improvement

[6] The Home Improvement Agencies in England are local organisations which offer help, information and advice to help older, disabled and vulnerable people.

Agency), the ability to turn to family and close friends for help, or gain support within the household for careful rationing of energy use, people spend time and effort making, managing and maintaining relationships with others, in order to enable access to adequate energy services. We can also see that the ability or inability to access adequate energy services shapes our interviewees' social relations. Inadequate access to energy services, for instance, mean that Marina and Alice have to restrict children's use of cold bedrooms in the winter, and paying the energy bills for the services she needs means that Marie is unable to afford to telephone her family.

The broader social context is also hugely important in our accounts. For instance, Marina's experience as an immigrant (*collectivity*) to the UK reminds us of the importance of public discourses around entitlement to help (*reasons*). Living in a cold, damp and poorly insulated home (*resource*), as Alice does, which is in itself a function of the level of investment we are collectively prepared to make in the building stock, compounds her situation, especially given that her landlord (housing association) is failing to remedy these problems (under investment in *resources*). These challenges can become particularly acute when people feel they are unable to fulfil their *roles* as parents, or grandparents due to lack of access to energy services (Marina and Alice) or when someone's social position (Marie as an older person, Marina as someone with a disability, Alice's children's health issues) results in them having additional needs.

In Fig. 1 we present a systemic model of energy poverty which brings together the concepts that we outlined in our theoretical work above. It offers an explanation of the relationship between social context, people's capabilities to engage in social relations and their ability to access energy services. The diagram reads from left to right, suggesting a processual way of explaining these relationships. However, the arrows (representing feedback loops) show that there is also the potential for each of the elements to impact on each other. This amounts to a cyclical and systemic relationship, in contrast to the sequential one posited by Day et al. [4]. It also allows for a change in any of the elements (access to energy services, capabilities or social factors) to trigger a change across the system, which in turn might have knock on effects.

Note that the strengths of each of the elements detailed here: both the social context and the social relations elements, is likely to be dependent on the specific context of the person experiencing energy poverty. For example, we have not seen evidence of the energy poor radically reshaping social institutions in our sample, but this does not mean that this is impossible. Indeed we have seen evidence elsewhere of people engaged in activism on this topic [46]. Equally, for some people membership of the 'older people' collectivity may reduce their capability to make and maintain meaningful social relations, for others this may increase their capability. We offer the diagram in the spirit of enumerating the elements that impact on social relations, and on access to energy services, rather than positing the strength of causal relationships between them.

We refer to this conceptual model as 'systemic', and this deserves further explanation. By focusing on the capabilities associated with social relations, we have shown how these capabilities are intimately connected to the social context, and how each of these impacts on people's access to energy services, and vice versa. This is 'systemic', first, because it gives a socially deep account of this aspect of energy poverty, characterising it as embedded in, and shaped by the complexities of people's social lives. Second, it understands social factors, capabilities, and the ability to access energy services as existing within a web of causality: each is seen to potentially impact the other, and a change in one is likely to have knock-on effects.

In the realist methodological tradition [42,49], we see this as the beginning of a more substantive effort to craft a systemic understanding of energy poverty, which we hope to develop in future work. We see a number of opportunities to advance these ideas. For instance, there are other capabilities that are likely to be served well by similarly systemic explanations. The relationship between good health and access to energy services is also likely to be bidirectional. If one is in poor health, one is likely to both need more energy services (in the form of heat or warm water for washing), and also less likely to be able to access adequate energy services (given the association of poor health or disability with poverty) [47]. Once we see the relationship between poor health and ability to access energy services as a bidirectional one, we can also appreciate how people experiencing poor health are likely to descend into a vicious circle, when their inability to access energy services triggers further poor health.

6. Conclusions

This paper makes a number of contributions to the literature, by theorising and evidencing the connection between social relations and energy poverty. The first contribution here is empirical: in profiling the

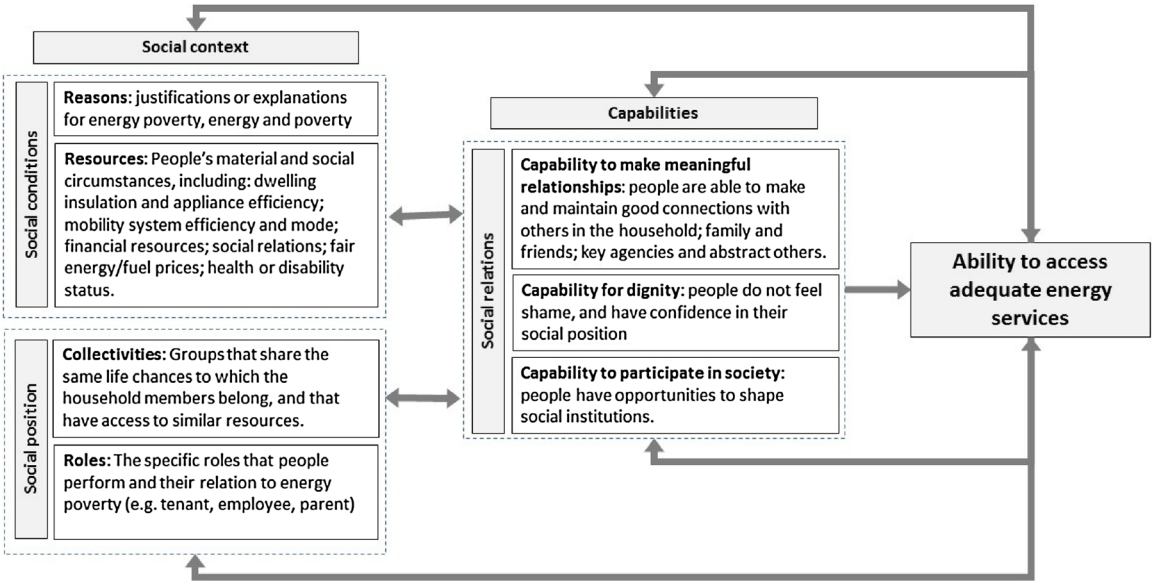

Fig. 1. Conceptualising the systemic relationships between ability to access energy services, social relations capabilities, and the social conditions and positions which shape these.

importance of social relations, we bring to the fore this rather understudied aspect of energy poverty. It is clear in the accounts we present that people experience energy poverty in the context of their relationships with others, that social relations impact on their ability to access adequate energy services, and that energy poverty impacts on their ability to engage socially with others. People's relationships with family and friends, key actors, and abstract others, shape their experiences in interesting, and as yet rather under-researched ways. We have characterised these insights by drawing on concepts from the capabilities literature, including both articulating what we mean by social relations, and characterising the social context in which these capabilities can exist. While access to resources and membership of collectivities are frequently referred to in debates around energy poverty, the concepts of reasons and roles make a useful addition to characterising vulnerability in this space.

We have also linked these concepts to each other, positing a bidirectional relationship between capability to engage in social relations and ability to access energy services, which is in itself shaped by the social factors we elaborate and refine above (access to resources, membership of particular collectivities, the need to perform particular social roles, and the common explanations for poverty and energy). We characterise this as a socially systemic understanding of energy poverty which extends the more sequential model posited by Day et al. [4]. Drawing on the capabilities approach (Sen and Nussbaum) combined with Smith and Seward's work, we show this bidirectional relationship to be structured by social context, which creates the conditions that enable or constrain people's capabilities. Our theoretical work suggests that there are likely to be unintended consequences from current energy poverty policy and practice, as well as potential for more effective policy and practice which takes into account the impact of social relations on energy poverty and vice versa. For instance, knowing that people depend on relationships outside of the home to access energy services, makes addressing energy poverty through households potentially problematic. As such, policy approaches should be designed that seek to recognise the range of social relations that impact on people's capabilities, and not merely those bounded by household units.

The final contribution is a methodological one: in approaching a large and disparate body of secondary qualitative data on energy poverty collected by a number of researchers over many years, we have been able to conduct useful and insightful investigations, which advance both empirical and theoretical understandings of energy poverty. This is a proof of concept: that secondary qualitative data analysis has value in addressing this problem, and that considerable data exists in the UK with which this kind of analysis can be taken forward. In asking these research questions of secondary qualitative data, we have created a valuable opportunity to elaborate a richer account of the experience of energy poverty. This has provided new insights into how people's capabilities may (or may not) be mobilised, to access services that address energy poverty, to warm their homes and keep them cool, to be mobile, and to address their health and wellbeing.

Acknowledgements

The authors are thankful to the White Rose Collaboration Fund for funding the research that lead to this paper. We are also indebted to the primary researchers who conducted the interviews that we used in our analysis, some of whom were not in the team of authors. The primary research that was drawn on during this project was funded by: UK Energy Research Centre (EP/L024756/1, and Carbon Crucible), National Institute for Health Research (PB -PG-0408-16041), Engineering and Physical Sciences Research Council (EPSRC EP/K011723/1), Energy Savings Trust (M47) and Collaboration for Leadership in Applied Health Research and Care for South Yorkshire, Foundations Independent Living Trust Ltd, EAGA Charitable Trust, and the Chesshire Lehmann Fund. Finally, we would like to thank the interviewees who took part in these research projects, for sharing their often difficult experiences of energy poverty.

References

[1] N. Simcock, G. Walker, R. Day, Fuel poverty in the UK: beyond heating? People Place Policy Online 10 (2016) 25–41.
[2] S. Bouzarovski, S. Petrova, A global perspective on domestic energy deprivation: overcoming the energy poverty–fuel poverty binary, Energy Res. Soc. Sci. 10 (2015) 31–40.
[3] L. Middlemiss, R. Gillard, Fuel poverty from the bottom-up: characterising household energy vulnerability through the lived experience of the fuel poor, Energy Res. Soc. Sci. 6 (2015) 146–154.
[4] R. Day, G. Walker, N. Simcock, Conceptualising energy use and energy poverty using a capabilities framework, Energy Policy 93 (2016) 255–264.
[5] R. Gillard, C. Snell, M. Bevan, Advancing an energy justice perspective of fuel poverty: household vulnerability and domestic retrofit policy in the United Kingdom, Energy Res. Soc. Sci. 29 (2017) 53–61.
[6] S. Meyer, L. Holzemer, B. Delbeke, L. Middlemiss, K. Maréchal, Capturing the multifaceted nature of energy poverty: lessons from Belgium, Energy Res. Soc. Sci. 40 (2018) 273–283.
[7] L. Middlemiss, R. Gillard, V. Pellicer, K. Straver, Plugging the gap between energy policy and the lived experience of energy poverty: five principles for a multi-disciplinary approach, in: C. Foulds, R. Robison (Eds.), Advancing Energy Policy: Lessons on the Integration of Social Science and Humanities, Springer, Bern, 2018.
[8] R. Hitchings, R. Day, How older people relate to the private winter warmth practices of their peers and why we should be interested, Environ. Plan.-Part A 43 (2011) 2452.
[9] W. Anderson, V. White, A. Finney, Coping with low incomes and cold homes, Energy Policy 49 (2012) 40–52.
[10] A.M. Tod, A. Lusambili, C. Homer, J. Abbott, J.M. Cooke, A.J. Stocks, K.A. Mcdaid, Understanding factors influencing vulnerable older people keeping warm and well in winter: a qualitative study using social marketing techniques, BMJ Open 2 (2012) e000922.
[11] R. Walker, C. Liddell, P. Mckenzie, C. Morris, S. Lagdon, Fuel poverty in Northern Ireland: humanizing the plight of vulnerable households, Energy Res. Soc. Sci. 4 (2014) 89–99.
[12] F. Mckague, M. Scott, B. Wooliscroft, R. Lawson, Understanding the Energy Consumption Choices and Coping Mechanisms of Fuel Poor Households in New Zealand, New Zealand Sociology, 2016.
[13] A.M. Tod, P. Nelson, A.C. De Chavez, C. Homer, V. Powell-Hoyland, A. Stocks, Understanding influences and decisions of households with children with asthma regarding temperature and humidity in the home in winter: a qualitative study, BMJ Open 6 (2016) e009636.
[14] A.C. De Chavez, The triple-hit effect of disability and energy poverty, in: N. Simcock, H. Thomson, S. Petrova, S. Bouzarovski (Eds.), Energy Poverty and Vulnerability, Routledge, 2017.
[15] C.N. Grey, T. Schmieder-Gaite, S. Jiang, C. Nascimento, W. Poortinga, Cold homes, fuel poverty and energy efficiency improvements: a longitudinal focus group approach, Indoor Built Environ. 26 (2017) 902–913.
[16] R. Mould, K.J. Baker, Documenting fuel poverty from the householders' perspective, Energy Res. Soc. Sci. 31 (2017) 21–31.
[17] N. Willand, R. Horne, "They are grinding us into the ground"–the lived experience of (in) energy justice amongst low-income older households, Appl. Energy 226 (2018) 61–70.
[18] N. Longhurst, T. Hargreaves, The Emotions of Fuel Poverty: Energy Vulnerability and the Lived Experience of Social Housing Tenants in the United Kingdom, Energy Res. Soc. Sci. (2019) in press.
[19] B. Boardman, Fixing Fuel Poverty, Earthscan, London, 2010.
[20] H. Titheridge, N. Christie, R. Mackett, D. Oviedo Hernández, R. Ye, Transport and Poverty a Review of the Evidence, UCL, 2014.
[21] C. Liddell, C. Morris, Fuel poverty and human health: a review of recent evidence, Energy Policy 38 (2010) 2987–2997.
[22] J. Gilbertson, M. Grimsley, G. Green, W.F.S. Group, Psychosocial routes from housing investment to health: evidence from England's home energy efficiency scheme, Energy Policy 49 (2012) 122–133.
[23] C.D. Maidment, C.R. Jones, T.L. Webb, E.A. Hathway, J.M. Gilbertson, The impact of household energy efficiency measures on health: a meta-analysis, Energy Policy 65 (2014) 583–593.
[24] T. Schwanen, K. Lucas, N. Akyelken, D. Cisternas Solsona, J.-A. Carrasco, T. Neutens, Rethinking the links between social exclusion and transport disadvantage through the lens of social capital, Transp. Res. Part A Policy Pract. 74 (2015) 123–135.
[25] D. O'Leary, J. Salter, Ties That Bind, Demos, 2014.
[26] L. Stock, J. Corlyon, C. Castellanos Serrano, M. Gieve, Personal Relationships and Poverty: An Evidence and Policy Review, Tavistock Institute, 2014.
[27] T. Shildrick, R. Macdonald, Poverty talk: how people experiencing poverty deny their poverty and why they blame 'The poor', Sociol. Rev. 61 (2013) 285–303.
[28] K. Garthwaite, 'Keeping meself to meself' – How social networks can influence narratives of stigma and identity for long-term sickness benefits recipients, Soc. Policy Adm. 49 (2015) 199–212.
[29] M. Nussbaum, A. Sen, The Quality of Life, Oxford University Press, Oxford, UK, 1993.
[30] I. Robeyns, The capability approach: a theoretical survey, J. Hum. Dev. 6 (2005) 93–117.
[31] A. Sen, Development as Freedom, Oxford University Press, Oxford, 1999.
[32] M.C. Nussbaum, Women and Human Development: the Capabilities Approach, Cambridge University Press, Cambridge, UK, 2001.

[33] K. Brown, K. Ecclestone, N. Emmel, The many faces of vulnerability, Soc. Policy Soc. 16 (2017) 497–510.
[34] L. Middlemiss, A critical analysis of the new politics of fuel poverty in England, Crit. Soc. Policy 37 (2017) 425–443.
[35] M.L. Smith, C. Seward, The relational ontology of Amartya Sen's capability approach: incorporating social and individual causes, J. Hum. Dev. Capabil. 10 (2009) 213–235.
[36] M.C. Nussbaum, Creating Capabilities, Harvard University Press, 2011.
[37] A. Sen, Inequality Reexamined, Harvard University Press, Cambridge Ma, 1992.
[38] A. Sen, Social Exclusion: Concept, Application, and Scrutiny. Social Development Papers No. 1, Asian Development Bank, 2000.
[39] M.S. Archer, Realist Social Theory: the Morphogenetic Approach, Cambridge University Press, Cambridge, 1995.
[40] H. Dean, Critiquing capabilities: the distractions of a beguiling concept, Crit. Soc. Policy 29 (2009) 261–278.
[41] S. Deneulin, J.A. Mcgregor, The capability approach and the politics of a social conception of wellbeing, Eur. J. Soc. Theory 13 (2010) 501–519.
[42] N. Emmel, Sampling and Choosing Cases in Qualitative Research: a Realist Approach, SAGE, 2013.
[43] J. Heaton, Secondary analysis of qualitative data: an overview, Hist. Soc. Res./ Historische Sozialforschung (2008) 33–45.
[44] S. Irwin, M. Winterton, Qualitative secondary analysis and social explanation, Sociol. Res. Online 17 (2012) 4.
[45] A. Tarrant, Getting out of the swamp? Methodological reflections on using qualitative secondary analysis to develop research design, Int. J. Soc. Res. Methodol. 20 (2017) 599–611.
[46] S.T. Herrero, Power to the People: Barcelona's Alliance Against Energy Poverty International Forum on Urbanism, (2018) Barcelona.
[47] C. Snell, M. Bevan, H. Thomson, Justice, fuel poverty and disabled people in England, Energy Res. Soc. Sci. 10 (2015) 123–132.
[48] B. Fine, Social Capital Versus Social Theory Political Economy and Social Science at the Turn of the Millennium, Routledge, London, 2001.
[49] R. Pawson, N. Tilley, Realistic Evaluation, Sage, London, 1997.