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Understanding the Multiple Harms of Energy Poverty through the Nussbaum's theory of Central Capabilities

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Abstract

It is widely recognised that energy poverty can have serious and detrimental impacts upon multiple aspects of people's well-being and life quality. This paper seeks to provide a multi-dimensional and theoretically-attuned account of the relations between energy poverty and well-being, through the use of the Capabilities Approach and specifically Nussbaum's normative theory of Central Capabilities. Drawing on interviews with 109 households in 4 European countries, we demonstrate how six of the ten Central Capabilities – namely Bodily Health, Emotions, Affiliation, Play, Practical Reason and Senses, Imagination & Thought – can be directly harmed by energy poverty. Our findings strengthen claims that energy poverty should be considered a serious form of (energy) injustice. We conclude by reflecting on the implications of our

work for energy poverty research and policy, and the opportunities opened up by adopting the Capabilities Approach.

Keywords:

Energy Poverty; Fuel Poverty; Capabilities Approach; Nussbaum; Well-being

1. Introduction

Energy poverty (also known as fuel poverty or domestic energy deprivation) is widely understood as a situation in which a household is unable to attain sufficient levels of domestic energy services, such as lighting, heating and cooling (Bouzarvoski and Petrova, 2015). It has become an issue of increasing concern in policy and research agendas, with numerous academic studies addressing its definition (Moore, 2012; Thomson et al., 2016), measurement (Hills, 2012; Liddell et al., 2012; Thomson et al., 2017); driving causes (Boardman, 1991; Middlemiss and Gillard; Simcock et al., 2018; Snell et al., 2015) and amelioration policies (Bouzarovski et al., 2012; Guertler, 2012; Teller-Elsberg et al., 2016).

Understanding how energy poverty impacts upon peoples' well-being and life quality is an important issue. A strong body of research in this domain has focused on its detrimental impacts on physical and, more recently, mental health. The harmful effects of living with cold indoor temperatures upon physiological health have been a core concern since the earliest research on the topic (Ambrose and Marchand 2017; Boardman, 1991; Gilbertson et al., 2012; Liddell and Morris, 2010; Ormandy and Ezratty, 2012). For example, the Marmot Review Team (2011) demonstrate a

relationship between cold homes and increased mortality (by increasing the number of Excess Winter Deaths) and morbidity (by causing or aggravating cardiovascular, circulatory and respiratory problems, as well as exacerbating conditions such as arthritis and rheumatism). Remaining within a health framing, some research has begun to document the multiple mental and emotional health impacts of living in energy poverty, finding direct links with increased anxiety, worry and depression (Butler and Sherriff, 2017; Day and Hitchings, 2011; Harris et al., 2010; Gilbertson et al., 2012; Grey et al., 2017; Longhurst and Hargreaves, 2019; Sherriff, 2016).

Beyond a health framing, there is also evidence of wider impacts of energy poverty upon quality of life and 'well-being' more broadly. For example, it has been shown that living in energy poverty can have harmful impacts upon people's social relationships inside and outside the home, potentially resulting in social isolation (Anderson et al., 2012; Middlemiss et al., 2019; Willand and Horne, 2018). Some research also finds that living in energy poverty can have detrimental effects upon children's educational attainment in multiple and complex ways (National Energy Action, 2020), while other studies demonstrate how it can interact with and contribute to other forms of deprivation - for example, the "heat or eat dilemma" (how heating and cooling costs contributes to food insecurity) (Beatty et al. 2014, O'Neill et al. 2006). Simcock et al. (2016) briefly suggest that the problem may hinder people's ability to undertake meaningful work or expand their knowledge, and Bouzarovski and Petrova (2015) argue that it prevents people from participating in society (see also Middlemiss et al., 2019).

Overall, research indicates that energy poverty can impact on people's lives in multiple and complex ways. However, research into these various impacts is quite fragmented and lacks a coherent conceptual framework or language. Furthermore, the implications of these impacts for normative questions of justice and injustice remain

underdeveloped. There is thus a need, we argue, to foreground a multidimensional analysis of how energy poverty affects people's well-being.

This paper therefore has two principal aims: (i) to develop a multidimensional understanding of how energy poverty harms human well-being; (ii) to begin to conceptualise how the harms of energy poverty can be understood as a distinct form of social and energy injustice. We draw on the Capabilities Approach (CA), and specifically a particular version of the CA, namely Nussbaum's theory of Central Capabilities (2000, 2006, 2011, 2016), as a conceptual and analytical lens. We argue that this theory provides a comprehensive and coherent framework for revealing the many ways that human lives can be blighted by energy poverty, one which encapsulates negative impacts on physical and mental health whilst also elucidating several other forms of injury. Furthermore, it provides a means to illuminate how energy poverty can be considered a distinct form of (energy) injustice.

The paper is organised as follows: in section 2 outline the central tenets of the CA and Nussbaum's theory of Central Capabilities, before describing our methods in Section 3. Section 4 reviews the main findings of our research, before Section 5 offers a concluding discussion.

2. Capabilities and Energy Poverty

2.1 Key elements of the Capability Approach

The CA is a framework used to assess and evaluate human well-being and the impact of poverty and inequality upon people's lives (Robeyns, 2005). It was initially developed by economist and philosopher Amartya Sen (1999; 2002; 2008) and later by the philosopher Marta Nussbaum (2000; 2003; 2006) and others (Alkire, 2002; Robeyns,

2005; Crocker, 2008). The CA asserts that evaluations of well-being or quality of life should ultimately focus not on what people have, in terms of their wealth or resources. Material goods are only means to ends, not ends in themselves. What people are able to actually achieve rather than what they have in material terms, the CA approach suggests, is what ultimately matters for human flourishing and well-being.

As a measure of well-being, the CA has two interlinked concepts: functionings and capabilities. *Functionings* can be defined as 'beings and doings' (Sen, 2008) – the actions that people perform and the states of being they achieve. They can include, for example, activities (e.g. eating, reading or having a shower); physical states (e.g. being healthy); mental states (e.g. being happy) or social activities (e.g. interacting with others). *Capabilities* are the substantive freedoms (also termed 'real freedoms' or 'substantive opportunities') to realise or achieve desirable functionings. Following this, the proposition is that human well-being should be evaluated in terms of whether people have the capabilities to achieve valued functionings (Nussbaum, 2011; Robeyns, 2005; Sen, 1999). Poverty and suffering are conceptualised as situations of *capability deprivation*, a situation in which a person lacks the capability to achieve certain critically valuable functionings (Alkire, 2007; Hick, 2012; Sen and Nussbaum, 1992).

2.1 Capabilities and Energy Poverty

Day et al. (2016), building on the theoretical grounding noted above, conceptualise the links between capability deprivation and *energy* poverty. They argue that energy services, such as heating and lighting, can be understood as not as intrinsic ends but as instrumental means for people to realise capabilities. When a person is deprived of certain energy services that are especially vital or essential, then this is likely to also result in deprivation of their capabilities (Walker et al., 2016). They thus propose that

energy poverty can be defined as *"an inability to realise essential capabilities as a direct or indirect result of insufficient access to affordable, reliable and safe energy services"* (Day et al., 2016, pp.260).

Whilst Day et al.'s work is highly valuable, it is also an abstract conceptual framework. Further empirical investigation is required to elucidate exactly how energy poverty hinders capabilities in real-world contexts. In what ways are people's lives blighted? Which capabilities are detrimentally affected? It is these questions that we address in this paper.

A few other recent studies have also sought to combine the CA with empirical insights on energy poverty. Malakar (2018) identifies the ways that electrification enhances the capabilities (such as those relating to security, recreation, health and climate change resilience) of rural households in India, including increased security. Bartiaux et al. (2019) use secondary survey data to examine how energy poverty deprives people of multiple important capabilities. Middlemiss et al. (2019) highlight how experiences of energy poverty influence (and are influenced by) the capabilities of having meaningful social relationships, having dignity, participating in society. Most recently Bartiaux et al. (2021) draw on interview data to examine how energy poverty impairs people of some capabilities proposed by Nussbaum (2011). Taking a similar approach to Bartiaux et al. (2021), our study seeks to build on and complement this work drawing on a particular version of the CA (Nussbaum's theory of Central Capabilities) to analyse qualitative data.

2.2 The Central Capabilities framework

Any attempt to assess poverty and quality of life using the CA must determine which capabilities are important for human well-being (to use Day et al.'s terminology, which

capabilities are ‘essential’) (Sen, 2008). The most appropriate way of doing this has long been debated in the CA literature (Hick, 2012). Amartya Sen has been reluctant to propose or endorse a defined set of capabilities for this purpose, arguing that it should be determined in particular contexts via deliberative processes (Sen, 2009). In this paper, however, we utilise the work of Nussbaum, who is more forthright in specifying which capabilities are most essential. She proposes a list of ten ‘Central Capabilities’ (hereafter ‘CC’), which she argues are the fundamental dimensions of a life commensurate with human dignity (Nussbaum, 2000, 2006, 2011, 2016). Table 1 presents these CC in full, using Nussbaum’s language.

There are several important features of the CC framework of relevance to this paper. First, it is *multi-dimensional*, providing a ‘thick’ and heterogeneous conception of what constitutes human flourishing rather than attempting to reduce this to a single denominator or element of life. This consensus is possible as long as the CC “are not just instrumental to further pursuits: they are held to have value in themselves, in making the life that includes them fully human” (Nussbaum, 2000: 74). Second, the CC are also irreducible and non-hierarchical – each are an equally important ingredient of a flourishing life, and deprivation of one cannot be compensated by abundance of another (Alkire, 2002; Nussbaum, 2011). Third, Nussbaum suggests that the CC are all *universal*, applying to all people in all places. She presents the list as a overlapping consensus on the part of people with have very different views of human life, as it presents a list “of aspects that are of central importance in any human life, whatever else the person pursues or chooses” (Nussbaum, 2000: 74). And fourth, the CC are proposed not only as a way to measure and compare quality of life between nations. They also form a “*partial theory of social justice*” (Nussbaum, 2000, p.6). Nussbaum argues that a failure to raise every CC to a sufficient level or above a certain ‘threshold’ (although

she is vague on exactly where this threshold lies) can be considered a moral wrong and form of injustice.

The universalist character of the CC framework has been criticised by several scholars as ethnocentric and lacking sensitivity to local and national context. Nussbaum has provided several defenses against these assertions. She suggests that the capabilities listed are sufficiently general and abstract to allow for contextually specific interpretation and practices – in short, they are very general goals that can be further specified by the society in question (Nussbaum, 2003: 40). Furthermore, she presents the theory as open for revision and debate, and indeed it has changed substantially since her early formulations (compare for example Nussbaum,1992 with Nussbaum, 2011). Importantly, Nussbaum did not derive the CC list purely from abstract theorizing. Rather, it draws upon her experiences listening to and deliberating with people experiencing hardship or injustices – particularly women living in India over the course of multiple visits throughout the 1980s and 1990s (Nussbaum, 2000).

In this paper, we utilise the CC framework as an analytical heuristic to analyse and categorise our interviewees' accounts of how energy poverty impacted their lives.

Table 1: Nussbaum's list of Central Capabilities (from Nussbaum, 2011)

[Table 1 near here]

3. Methods

This article is based on qualitative field studies conducted from 2014-2016 with households living in four European cities: Valencia in Spain, Gdańsk in Poland, Skopje in North Macedonia, and Budapest in Hungary. These interviews were conducted as

part of two separate projects (one in Valencia that the lead author and third author were involved in, and the other in Gdańsk, Skopje and Budapest involving the second author). However, the aims, objectives and research methods of both projects were very similar, as were the lines of inquiry explored in the interviews; they can therefore be combined appropriately into a consistent dataset, meeting the standards of transferability and rigour proposed by Bickerstaff et al. (2015). In all four countries recent studies have found that energy poverty is a significant problem, according to the index of 'being unable to keep the home warm' developed by the EU Energy Poverty Observatory (2021; see also Pellicer-Sifres, 2018, 2020; Tirado Herrero and Jiménez Meneses, 2016). At a city level, Bouzarovski and Thomson (2018) also find high energy poverty rates in Gdańsk, Skopje and Budapest. At the same time, the cities also exhibit important differences in terms of culture, climate, housing types, and political-economic histories and trajectories – thus, our rationale for this paper is that if there are similarities in the impacts of energy poverty across these 4 study locations, these impacts might reasonably be expected to be transferable to other contexts.

Semi-structured interviews were conducted with 109 households across the four cities (10 households from Valencia[1], 25 from Gdańsk, 39 from Skopje, and 34 from Budapest). Interviews are an appropriate method for uncovering the nuances of everyday life, including the lived experiences and impacts of energy poverty (e.g., Middlemiss and Gillard, 2015). The interviews explored participants' homes and economic circumstances, their use of energy in everyday life, and whether they had ever encountered situations in which they found their energy bills to be unaffordable and/or

[1] The Valencia sample was smaller than the other three cities due issues around recruitment and accessibility to data. Nevertheless, substantial differences between the results from Valencia and from other three countries were not found. And, as we explain below, for the purposes of this paper we largely treat the data as one single corpus rather than conducting detailed comparisons of the different settings. As such, we do not consider the smaller sample in Valencia to be a critical issue.

the energy services they were receiving to be insufficient for their needs. How they experienced and negotiated these latter two circumstances was then explored. It is important to note that our interview questions were not directly based upon the CC framework. Rather, the interviews were more open and general, with the framework later employed as a heuristic during analysis.

In all cities a purposive sampling strategy was adopted. We sought households living on low or modest incomes as these were more likely to have experienced, or be vulnerable to, energy poverty. We also aimed for diversity in households' demographic profile, housing type, and heating system, with the final sample of interviewees covering a wide-range of household compositions. A number of recruitment strategies were utilised. Principally, these involved: (i) leaving advertising leaflets and posters in public places and community centres; (ii) by using third-sector, housing and intermediary organisations working with disadvantaged or marginalised people as gatekeepers; and (iii) via the 'snowball' method. As with all research involving human participants, our sample was limited to those able and willing to participate, but as noted we still garnered considerable diversity in the profile of those interviewed.

All interviews were audio recorded and then transcribed verbatim. Following this, analysis was undertaken via coding of transcripts and accompanying fieldnotes, using the 'thematic analysis' procedure (Braun and Clarke, 2006). Coding was primarily deductive or 'theory-driven', with the CC used as a framework to categorise interviewee accounts. During the analysis, two further inductive codes emerged as additional capabilities typologies (external and inner sphere). The next section presents the empirical results of our research.

4. Multiple dimensions of well-being affected by energy poverty

Across the interviewee sample, our analysis found direct evidence of 6 of the 10 CC being impacted, sometimes severely, due to living in energy poverty. This is not to say that every interviewee was always harmed in relation to all 6 of these CC; however, all 6 were reported by at least some participants in all research locations.

Table 2 provides an overview of the prevalence that each CC was mentioned as being harmed or compromised, in terms of number of participants. We categorize this prevalence into 'high' (approximately >67% of participants), 'medium' (~34-66% participants) and 'low' (approximately <33% participants). Note that this is based on the number of participants mentioning a particular CC – it does not consider number of mentions *per participant*. From the table it can be seen that harms relating to the CC of *Bodily Health, Emotions, Practical Reason,* and *Affiliation A* were mentioned most frequently. Our analysis and discussion here is seeking to understand and illuminate broad patterns and commonalities that cut across the four study locations (similar to e.g. Walker et al., 2013). As such, we do not discuss in-depth any contextual differences between the locations in terms of which CC were most or least prevalent or salient – although, importantly, in our analysis we did not find that such differences were clearly present in any fundamental way. The fact that we found such strong similarity across four study contexts is itself is significant, and lends support to Nussbaum's (2000, 2011) assertion that the CC are 'universal' and applicable to all people regardless of their contextual circumstances or personal values.

We did not find direct evidence of the CC of *Life, Bodily Integrity*, *Other Species*, and *Control over One's Environment* being harmed by energy poverty. However, this is not to say that, in all circumstances and for all people, these three capabilities will never be

affected. For example, there is evidence to suggest that, in extreme cases, energy poverty can lead to premature mortality especially during the winter months (Liddell et al., 2016), therefore impacted on the CC of *Life*. However, in the remainder of this paper we focus only on those capabilities for which we found direct evidence of being impaired by energy poverty.

Table 2: overview of the prevalence of each CC

[Table 2 near here]

Although we present evidence for each of the CC in separate sections, in reality they are often interlinked and (deprivation of) one CC can affect the other CC. We present them separately in sections 4.1-4.6 to clearly show the multidimensional impacts of energy poverty and return to the point of the interrelation between capabilities in sections 5 and 6.

4.1 Bodily Health

There was a medium prevalence in our interviews of comments about the link between low indoor temperatures and bodily health, with some suggesting that living in a cold home had resulted in them getting ill during the winter. One participant stated, for example, that "*We spend all winter with colds, and it gets worse each time*"[2] (Nicolás[3], Male, 40s, Valencia). These perceptions echo previous literature, which has found that living in an insufficiently warm dwelling can create or exacerbate a range of health problems (Marmot Review Team, 2011).

An additional finding of our research was reports that excessively *high* indoor temperatures could also harm physical health. This was raised by some participants in

[2] Quotes translated to English from native language
[3] All quoted interviewees have been assigned anonymous pseudonyms

all four interview countries (this was considered a medium prevalence in the sample). Many described issues of general discomfort and lethargy, but it was older people and/or those with pre-existing medical conditions that reported the most severe consequences. For example:

> *"[The summer heat] affected my health, I have several conditions, so it is difficult for me in the heat. The others [living in the household] are not bothered by the heat that much."* (Ivan, male, 60s, Skopje)

Research on heatwaves, has found links between indoor heat and poor health (e.g. Klinenberg, 1999, 2002; Mitchell and Chakraborty, 2014; Opperman et al., 2017; Song et al., 2017); however, to date this has not usually been explicitly conceptualised as an issue of energy poverty (although see, Lomas and Porrit, 2017, Sánchez et al. 2017 or Thomson et al., 2019 for some exceptions).

Our findings also support other research that argues physical health can be harmed indirectly via energy poverty impeding other aspects of life, such as reducing access to adequate nutrition (known as "the heat or eat dilemma", for more information see Beatty et al. 2014, O'Neill et al. 2006). Some interviewees (medium prevalence) confessed to reducing their consumption of hot meals (see Snell et al., 2018 for a further discussion of this issue), which could be considered a proxy for calorific intake and nutrition (although more specialist research would be required to confirm this). A few of them (low prevalence) had difficulties to sleep at night due to excessive indoor heat or cold – both of which could then have knock-on consequences for physiological health. Overall, there is evidence to suggest that energy poverty can impact upon the CC of *Bodily Health*, especially the aspects relating to "Being able to have good health" and, indirectly, being "adequately nourished".

4.2 Emotions

A wide-range of interviewees (high prevalence) suggested that living in energy poverty induced a range of negative emotions, especially strong feelings of sadness, anxiety and fear. This could result from the experience of living in a cold or excessively warm home, due to discomfort and concern for the well-being of family members:

> *"It is never comfortable in our home in wintertime. The extent of winter depends on how many prayers we have to say, depending on how cold it gets ... I don't know how many prayers I say every winter for a mild weather, because this house is like a cheese full of holes and it lets in everything, except the spring heat."* (Roland, male, 30s, Budapest)

Some interviewees referring to these feelings also described how the stress of managing energy costs on a strained budget could lead to deep anxiety about, for example, unaffordable bills and the potential of electricity provision being cut-off by energy suppliers. The following quotes exemplify such feelings:

> *"I can't sleep at night because of worries. When I am awake I make sums: electricity bill plus gas bill plus water plus mortgage… I know electricity bill comes about 23th each two months, and one week before I am already worried about which excessive amount will be this time…"* (Cecilia, female, 40s, Valencia)

> *"I don't open the door to anybody. When someone knocks the door, I rest silent at home. It maybe someone who comes to cut me the water or the gas… I have a debt, I just pay electricity because if I don't pay they can cut it without coming into my house. With gas and water is different, they need*

to come into to cut it. I am scared each time that the doorbell sounds."

(Antonella, female, 50s, Valencia)

"Honestly, I don't open the envelopes with bills. They just pile up. I used to open them before, but now that we can't pay them I can't bear to look at them."

(Mila, female, 20s, Skopje)

These accounts again reaffirm the findings of previous literature, which has usually categorised such emotional distress under the framing of 'mental health' (rather than 'emotional') impacts (Butler and Sherriff, 2017; Liddell and Morris, 2010; Longhurst and Hargreaves, 2019; Sherriff, 2016).

Such impacts relate to the CC of *Emotions*. Nussbaum argues that this CC includes "Not having one's emotional development blighted by fear and anxiety." Yet, as evidenced by our and other research, fear and anxiety often feature pervasively in the lives of those experiencing energy poverty. In short, there is strong evidence that energy poverty can directly harm the CC of *Emotions* by inducing fear, anxiety, and emotional distress.

4.3 Affiliation

The CC of *Affiliation* contains two elements. The first ('A') relates to the ability to connect and have interaction with other people; the second ('B') to being able to be respected and to have the bases of dignity. Our findings demonstrate that energy poverty can impact strongly upon both of these elements.

In terms of *Affiliation A*, several interviewees suggested that their social relationships and interactions with others had been harmed as a result of domestic energy deprivation. Most commonly (medium prevalence) this related to social relations with other household members being disrupted or strained, due to stresses relating to energy poverty. The need to carefully ration energy use to minimise energy consumption, and

the stress this induced, had in some cases resulted in household conflicts with several interviewees recounting disagreements with family members over the usage of heating and appliances. For example, Roland (male, 30s, Budapest) stated:

> *"They feel cold a lot more than I do and my wife and I have many fights about it, as she prefers to turn on the heating. When she wants to give a bath to the kids, she turns on the heating everywhere. It is okay now, but there were times when I told her that we have that small heater and it would be better to heat up only that small room, and it wouldn't consume as much."*

Less commonly (low prevalence), energy poverty had reduced contact with family and friends outside the home with the effect of increasing social isolation.[4] To evade the potential embarrassment of other people encountering their (perceived) poor living conditions and inadequate energy services, some respondents reported that they avoided hosting guests:

> *"Now no one comes to visit us. Actually, it's me who doesn't want no one to come, I feel embarrassed if they see how we live. Here is frozen and dark".*
> (Mateo, Male, 60s, Valencia)

> Interviewer: "Is this a place where you invite your friends?"
> Jakub (male, 20s, Gdańsk): *"Very rarely. Housing conditions here are poor."*

Such practices of 'withdrawal' (Walker et al., 2013) have been noted in other qualitative studies into the lived experience of energy poverty (e.g. Anderson et al., 2012; Grey et

[4] One reason for this was that practice of hosting was felt to necessitate a degree of energy consumption (such as making hot drinks or food, or warming the home) that those trying to keep their energy bills to a minimum could ill afford (see Petrova and Simcock, 2019).

al., 2017; Longhurst and Hargreaves, 2019). In our sample, it was of low prevalence in the overall sample, but was nonetheless present especially in some of the most extreme cases of energy poverty. Those who were experiencing less severe deprivation appeared to still undertake hosting by increasing their usage of energy services (such as warming the home) when guests were around, whilst restricting their consumption when alone (see also Hitchings and Day, 2011).

In sum, we found evidence that, especially in severe cases, energy poverty can harm social relationships and impede the CC of *Affiliation A*: engaging in beneficial and friendly social interaction. This matters intrinsically, because social contact and meaningful social relationships with others are widely considered as an important part of a decent life, with loneliness and isolation deeply harmful to well-being. It also matters instrumentally for the amelioration of energy poverty and the achievement of other valued capabilities. Family and friends can be important sources of support that help to lessen the worst effects of domestic energy deprivation (Middlemiss et al., 2019), so damage to interpersonal relationships risks producing a vicious circle in which those lacking social connection fall into deeper deprivation.

In terms of *Affiliation B*, we found evidence (medium prevalence) that energy poverty could harm this CC by potentially inducing feelings of shame, stigma, and lessened self-worth. Financial difficulties related to energy costs, such as being unable to pay household energy bills in a timely manner, or needing to borrow money in order to do so, were suggested or implied by many interviewees to be humiliating and shameful. In all study locations, interviewees described how they would never discuss financial difficulties relating to energy costs with anyone outside their household – in essence, it seemed to be something of a 'taboo' subject, with people adopting a strategy of privacy and 'concealment' (Walker et al., 2013) to avoid the stigma associated with such a

situation (see also Grossmann and Trubina, 2021). In Budapest and Gdańsk especially, several participants also expressed harsh and unforgiving attitudes to others who might be experiencing energy poverty (even when experiencing hardship themselves), thus indicating wider social stigma around the problem. Being unable to attain socially expected standards of lighting, warmth, and other energy services was a further source of stigma and shame. Karol (male, 30s, Gdańsk), for example, described how his need to heat his apartment using a kitchen hob made him feel "*like a pauper*", whilst Sofija (female, 20s, Skopje) spoke of being "*ashamed*" of her family's need to gather in a single room for warmth during the winter. Similarly, Isabella (female, 30s, Valencia) stated:

> *"Since we want to minimise the use of hot water, children have shower at school when they practice gym, and me and my wife have changed our habits and have shower less often. I am a little embarrassed for this, but it's like this"*

Shame, note Walker et al. (2013), is an especially damaging emotion that can severely corrode people's self-esteem and dignity. By inducing such feelings, energy poverty can thus directly harm *Affiliation B*, defined as having the bases of "self-respect and non-humiliation".

4.4 Senses, Imagination, and Thought

Some interviewees (medium prevalence) described how their children's ability to study was reduced or constrained by energy poverty. For instance, in severe cases our interviewees reported that computer usage for homework was restricted due to the need to minimise energy consumption. Some also reported only heating part of their home and the whole family gathering in a single room for warmth during the winter, a practice that can make doing homework difficult due to a lack of quiet study space (Barnes et al.,

2009; Evans et al., 2001). Another suggested that cold indoor temperatures simply made studying uncomfortable and hindered concentration:

> *"It feels cold at night in the apartment. It is not comfortable when we do homework, when we have to sit down and we are not moving around. You can feel that it is still cold. So, it's a constant dilemma…"* (Agnes, female, 40s, Budapest)

Such accounts tally with some previous studies that have found that children living in 'poorer quality' housing have lower motivation and task persistence than their counterparts living in better quality housing (Evans et al., 2001). These impacts can be understood as harming elements of the CC of *Senses, Imagination and Thought*. This CC covers a range of issues, but for our purposes being able to "to imagine, think, and reason … [in] a way informed and cultivated by an adequate education" is most relevant. By limiting appropriate study environments (which can have consequences for educational attainment), our evidence suggests that energy poverty can negatively impact this aspect of the CC.

Another aspect of *Senses, Imagination and Thought* that we found evidence could be harmed by energy deprivation was "being able to have pleasurable experiences". We discuss findings relevant to this element in Section 4.5 below.

4.5 Play

For Nussbaum, one ingredient of a minimally-decent quality of life is the CC for *Play*, which she defines as "Being able to laugh, to play, to enjoy recreational activities." Among our interviewees, energy poverty could sometimes reduce the opportunities to enjoy such experiences within their home. This was especially so among the most severe cases of energy poverty we observed and where relatively extreme measures to

reduce energy consumption had been adopted. For example, some respondents had reduced, or in some cases completely stopped, TV and computer usage. Although at first glance TV and computer use may not seem 'basic needs', their importance for relaxation, recreation and social interaction has been noted in the literature (e.g. Malakar, 2018). Another interviewee reported reading books much less:

> *"I love to read at night. I'd always loved it, it was a moment just for me. Now, I don't read, or I read but not for many hours… I don't want to spend electricity."* (Claudia, female, 40s, Valencia)

Financial pressure induced by high energy costs could also constrain opportunities for recreational activities outside of the home (see also Bartiiaux et al., 2021). For example, several interviewees described avoiding communal events or going out with friends or cancelling subscriptions to social clubs and societies.

4.6 Practical Reason

The CC of Practical Reason is defined as "Being able to form a conception of the good and to engage in critical reflection about the planning of one's life". In her earlier work Nussbaum makes clear this CC also means that individuals have some ability to *act* upon their thoughts. As she argues: "All human beings participate (or try to) in the planning and managing of their own lives, asking and answering questions about what is good and how one should live. Moreover, **they wish to enact their thought in their lives – to be able to choose and evaluate and function accordingly**" (Nussbaum, 1992, p.219, emphasis added).[5] However, our interviewees encountered severe

[5] Sen (1999) has also suggested that freedom to plan one's own life is a crucial constituent of a decent life.

restrictions in their opportunities to 'choose and evaluate', both on a day-to-day and longer-term basis.

Many of our interviewees described how they undertook multiple actions to tightly 'ration' and control their daily energy consumption to ensure adequate thermal comfort and/or the affordability of energy bills. Several of these behaviours echo those reported elsewhere in the energy poverty literature (Harrington et al., 2005; Longhurst and Hargreaves, 2019; Middlemiss and Gillard, 2015), and include spatial and temporal rationing of heating, wearing additional clothing, closely timing the usage of cooking facilities and other appliances, using minimal hot water and/or reducing showering, and using televisions as a source lighting. Many also kept a close watch on their energy bills and consumption levels, with a few even knowing their consumption 'limit' in kWh per day. The following quotes further exemplify these issues:

> *"To save energy I try to heat mostly those rooms where we already spend time. I am frustrated, because I would like to have warm in the whole apartment, but because of high heating cost we are enforced to such behaviour."* (Amelia, female, 30s, Gdańsk)

> *"We pay attention [to our energy usage]. We rarely have the lights on […] We don't cook every day. The food stays good in the fridge. You don't need freshly cooked meal every day. […] I pay attention to all my energy use. When I don't watch the TV anymore I don't just switch it off but plug it out. To make sure that it doesn't consume not even one HUF.*[6] *When I had a coffee maker I always plugged it out, I plug out the microwave oven every time after I use it, the same*

[6] HUF = Hungarian Forint

with the TV. After I am done with what I was doing in the bathroom I switch off the light immediately." (Candace, female, 60s, Budapest)

"Everyday we only use the woodstove in one of the rooms in the evening. We don't accumulate or use the fan on the main heating source. We limit the use of hot water, the lights, not so much the cooker … I feel limited. It is not pleasant" (Igor, male, 60s, Skopje)

These examples all demonstrate how the lives of many of our respondents were marked by a constant vigilance over their energy usage – and moreover that this vigilance was in many ways not discretionary, but an enforced necessity induced by the financial and material burden of energy poverty. This situation can be understood as harming their CC of *Practical Reason*, because in important aspects of everyday life they were impaired in their ability to "choose and evaluate, and function accordingly" (Nussbaum, 1992, p.219) – rather, they were disciplined into conducting their domestic practices in a relentlessly careful and regimented manner, with minimal opportunity for agency or improvisation.

Beyond the domestic space, we found (although with low prevalence) some interviewees who described how their wider hopes, dreams and life choices were constrained by domestic energy deprivation. For example, Nora (female, 50s) and Ferenc (male, 50s, Budapest) were a couple living in inner city Budapest. In recent years their energy bills had become increasingly expensive and their expenditure had to be carefully managed to ensure timely payment. Ferenc, in particular, lamented the lack of freedom and spontaneity this imposed upon their lives and ability to, for example, go on holiday, seek further education, or purchase anything but basic necessities:

"You are 'free', but really you're not free. The problem is that life goes by without you having had the chance to live it … Do we really work just to be able to pay our utility bills?"

This constraint upon longer-term agency, partly induced by expensive energy costs, can be seen as further harming people's CC of *Practical Reason*. Of course, this is clearly not distinctively or solely an 'energy poverty' issue – rather, energy-related issues are likely to be one contributory factor, alongside low-incomes and other forms of deprivation, in causing a lack of opportunities for agency in people's lives.

5. Discussion

This aim of this paper has been twofold: (i) to develop a multidimensional understanding of how energy poverty harms human well-being; (ii) to conceptualise how the harms of energy poverty can be understood as a distinct form of social and energy injustice. This discussion reflects on our major findings in relation to these two aims.

5.1 Multidimensional Harms

Drawing on over 100 qualitative interviews, this paper has demonstrated that energy poverty can inflict harm upon human well-being in multidimensional and diverse ways. Furthermore, Nussbaum's list of Central Capabilities (CC) has provided comprehensive and coherent framework for illuminating, understanding and categorising these multiple harms. In all four study locations, we found evidence for 6 of the 10 CC being negatively impacted as a result of living in energy deprivation. This supports earlier findings of Bartiaux et al. (2019), whilst adding much richness and detail due to our use of a qualitative approach. The fact that our findings were similar across all four of our

study locations, despite their contextual differences, suggests that they are widely transferable and supports Nussbaum's (2000, 2011) assertion that the CC are universally important dimensions of human well-being.

Some of the impacts noted in our study relate to the physical and mental health effects that are already widely reported in the energy poverty literature, thus supporting and validating earlier studies. In particular, we found very strong evidence of energy poverty blighting people's emotional and mental well-being (Section 5.3), due to unaffordable energy costs and/or inadequate domestic energy services causing feelings of fear, anxiety and distress (echoing Bartiaux et al., 2021 and Longhurst and Hargreaves, 2019).

More significantly, the CC framework has enabled us to move beyond these dominant ideas and to reveal and systemise impacts of energy poverty that have not been as widely explored in previous literature. This includes on people's ability to enjoy recreational activities (*Play*) and on their educational opportunities and experiences (*Senses, Imagination and Thought*) (as also reported by Bartiaux et al., 2021). We found even stronger evidence of energy poverty impacting upon people's ability to form or maintain meaningful social relationships (*Affiliation A*) and on their sense of self-worth and dignity (*Affiliation B*) (see Grossmann and Trubina, 2021; Middlemiss et al., 2019). The latter of these was especially prevalent among participants across our case studies, strongly suggesting that it is often a central feature of the lived experience of domestic energy deprivation. The finding that energy poverty strongly impedes the CC of *Practical Reason* is also notable. Our study demonstrates that it is one of the most pervasive and defining forms of suffering arising from energy poverty. Yet to our knowledge the restrictions energy poverty places on people's everyday agency has never previously been conceptualised as a harm in its own right. Bartiaux et al. 2021 do

discuss some similar issues, but consider these in terms of the CC of *Senses, Imagination and Thought*; however, in our view conceptualizing it as an impairment of *Practical Reason* more clearly illuminates its distinctiveness as a form of harm.

A valuable contribution of the CC framework is that it enables these diverse forms of harm to be brought together into a single, coherent framework. Furthermore, Nussbaum also asserts that the CC are non-hierarchical and are equally important ingredients for a life commensurate with human dignity. This emphasizes the importance of capabilities that could be easily dismissed as 'trivial' (e.g. *Play* or *Practical Reason*), and of ensuring people can access not only the bare minimum of energy services required for survival or health, but also those needed to, for example, take part in domestic recreational activities or to have some freedom during one's day-to-day life.

These various impacts can be further categorised into two dimensions of the human experience. First, the 'inner' sphere, relating to what Nussbaum (2000, pp.31) defines as "what they hope for, what they love, what they fear, as well as what they are able to do". In this sense, our findings describe the effect that energy deprivation has on people's senses, emotions and self-esteem. Second, the 'external' sphere, relating to people's life options and living conditions (White and Abeyasekera, 2014). In this respect, we describe how energy poverty limits opportunities for social interaction, for recreation and education, for living in a healthy environment, and for being able to have autonomy and make choices.

It is important to note that, although we have presented and analysed the CC separately, in reality they are often interlinked and reinforcing. That is, energy poverty having negative impacts upon one CC can cause or lead to detrimental consequences for another (Bartiaux et al., 2021). Wolff and De Shallit (2007) term this phenomenon

"corrosive disadvantage". For example, reductions in educational opportunities caused by energy poverty can impact educational attainment, which is known to be an important determinant of long-term health (Marmot Review Team, 2011) – harm to the CC of *Senses, Imagination and Thought*, therefore, can ultimately harm the CC of *Bodily Health.* Similarly, we found evidence that energy poverty can harm the CC of *Affiliation* by reducing people's self-esteem and inducing social isolation – situations that can induce sadness and anxiety and thus harm the CC of *Emotions,* whilst also potentially reducing recreational opportunities (*Play*) and the social resources people are able to draw on to help maintain *Bodily Health*. Finally, our findings also suggest that a prime cause of emotional distress (*Emotions*) can be the lack of freedom and autonomy in everyday life caused by energy poverty – that is, impairment of the CC of *Practical Reason.* The flipside of this, however, is that policies to ameliorate energy poverty can also enhance multiple CC simultaneously in a 'virtuous circle' (Bartiaux et al., 2021).

5.2 Energy Poverty as a form of energy injustice

Our work has demonstrated that domestic energy services are often material pre-requisites for several of the CC – a situation in which a person is deprived of core energy services (i.e. energy poverty) can also, directly and indirectly, impair people's CC. Importantly, and as noted in Section 2.3, Nussbaum argues that, because the CC are "a bare minimum of what respect for human dignity requires" (2011, pp.5), a circumstance in which a person is deprived of any of them below a minimum 'threshold' level is not merely unpleasant or unfortunate but instead "should be seen as a situation both unjust and tragic, in need of urgent attention" (ibid., p.71). Therefore, following this it can be argued that by depriving people of the material pre-conditions necessary for full achievement of the CC to which they are entitled, energy poverty is

itself a form and cause of *injustice.* This has two important implications, one conceptual and one political.

Conceptually, although energy poverty has been broadly framed as a form of injustice with the 'energy justice' literature (Jenkins et al., 2016; Simcock and Mullen, 2016; Walker and Day, 2012), it has not been connected in detail to specific theories of justice or sets of moral principles. By demonstrating how energy poverty connects to a particular justice theory, our paper advances these debates and presents a deeper account of how energy poverty can be considered a particular form of injustice. In short, it begins to address the moral question of why energy poverty matters and should concern us all.

Politically, seeing energy poverty as an injustice is a valuable tool for asserting the fundamental rights of energy poor households. Nussbaum (2000, pp.6) argues that the CC can "provide a basis for central constitutional principles that citizens have a right to demand from their government" (ibid. pp12). In practice, this also means that the material conditions necessary to achieve the CC are also basic rights (ibid.). In short, the domestic energy services that are necessary for the attainment of the CC are not simply 'nice-to-have' but are essential rights to be demanded by all citizens. Conceptualising energy poverty, and the harms it causes, as a moral issue reminds us that its alleviation is not simply an optional act of charity or benevolence, but a fundamental obligation of governments.

However, there is one further complexity to acknowledge. Nussbaum's (2000, 2011) argument is that all people are justly entitled to a minimum 'threshold' level of all the CC, and that an injustice occurs if any fall below this threshold. However, she has not fully elaborated exactly where the threshold lies or how this might be determined (other

than to state that it should be set 'locally' by each nation in accordance with their history and traditions – see Nussbaum, 2011). As such, making a complete claim of injustice from the evidence in this paper is difficult – we have been able to demonstrate that our participants' CC were harmed by energy poverty, but cannot say whether this harm took their CC below the minimum threshold required for justice. We would argue that this is an important challenge for future research on this topic.

6. Conclusions and future research directions

In this paper, using Nussbaum's theory of Central Capabilities (CC) we have presented a new framework for understanding the multiple ways that human well-being can be harmed by energy poverty. This framework encompasses commonly discussed negative impacts, such as those to physical and mental health, but also elucidates forms of harm that have previously been overlooked. Furthermore, as a theory of justice the CC framework also enables a more precise and detailed account of how energy poverty may be considered a form of (energy) injustice. In making this argument, the paper adds a new perspective to recent attempts to connect energy poverty and the CA (Bartiaux et al., 2018, 2021; Day et al., 2016; Malakar, 2018; Middlemiss et al, 2019), as well as contributing to energy justice literature.

We conclude by proposing three areas for further research:

- Our research has revealed harms of energy poverty that have previously not been widely noted in energy poverty research, particularly relating to stigma and shame (*Affiliation B*), social isolation (*Affiliation A*), and lack of autonomy in everyday life (*Practical Reason*). Specialist research could more closely examine the relationship between energy poverty and these various forms of

injury. And, although we only found direct evidence for 6 of the 10 CC being negatively impacted by energy deprivation, whether the remaining 4 can also be affected is also worthy of examination. In particular, we suggest that being unable to attain certain energy services, such as accessing the internet, may in some circumstances restrict a person's ability to take part in politics – and therefore impair their CC of *Control Over One's Environment*.

- Related to the above, we noted in Section 5.1 that although we have presented and analysed energy poverty's impacts on the various CC as distinct and separate forms of harm, we also found evidence to suggest that they are often interlinked and reinforcing. It has been beyond the scope of this paper to explore this issue in greater depth (although see Middlemiss et al 2019 for deeper discussion of the interrelation of different capabilities), but to fully understand the causes and consequences of energy poverty we consider this to be an important future research direction.
- Our analysis has found evidence to suggest that the impact of energy poverty on human well-being may vary between individuals based on factors such as age, gender, family role, and social capital. Whilst there has been acknowledgement of variation in the impacts of energy deprivation on physical health (for example, it is widely suggested that older people are vulnerable to negative health impacts caused by cold home), how and why the other impacts of energy poverty might vary between individuals and social groups has hardly been explored. Doing so has been beyond the scope of this paper, but we believe that this is a very important area for further investigation.

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