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Understanding the multiple harms of energy poverty through 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 6 of the 10 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.

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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 (Bouzarovski 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, Snell, and Liddell 2016), measurement (Hills 2012; Liddell et al. 2012; Thomson, Bouzarovski, and Snell 2017); driving causes (Boardman 1991; Middlemiss and Gillard 2015; Simcock et al. 2018; Snell, Bevan, and Thomson 2015) and amelioration policies (Bouzarovski, Petrova, and Sarlamanov 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, Grimsley, and Green 2012; Liddell and Morris 2010; Ormandy and Ezratty 2012). For example, the Marmot Review Team (2011) demonstrated 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

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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, Grimsley, and Green 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, White, and Finney 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, Blow, and Crossley 2014; O’Neill, Jinks, and Squire 2006). Simcock, Walker, and Day (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 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 multi-dimensional analysis of how energy poverty affects people’s well-being.

This paper, therefore, has two principal aims: (i) to develop a multi-dimensional 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: section 2 outlines 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 Martha 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 1993).

2.1.1. Capabilities and energy poverty

Day, Walker, and Simcock (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. 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, Walker, and Simcock 2016, 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. (2018) 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, Day, and Lahaye (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, Day, and Lahaye (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.

2.1.2. 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 is 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 an overlapping consensus on the part of people with have very different

Table 1. Nussbaum's list of central capabilities.

1. *Life.* Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.
2. *Bodily Health.* Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.
3. *Bodily Integrity.* Being able to move freely from place to place; to be secure against violent assault, including sexual assault and domestic violence; having opportunities for sexual satisfaction and for choice in matters of reproduction.
4. *Senses, Imagination, and Thought.* Being able to use the senses, to imagine, think, and reason – and to do these things in a “truly human” way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to have pleasurable experiences and to avoid non-beneficial pain.
5. *Emotions.* Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by fear and anxiety. (Supporting this capability means supporting forms of human association that can be shown to be crucial in their development.)
6. *Practical Reason.* Being able to form a conception of the good and to engage in critical reflection about the planning of one's life. (This entails protection for the liberty of conscience and religious observance.)
7. *Affiliation.* (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 non-humiliation; 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.
8. *Other Species.* Being able to live with concern for and in relation to animals, plants, and the world of nature.
9. *Play.* Being able to laugh, to play, to enjoy recreational activities.
10. *Control over One's Environment.* (A) *Political.* Being able to participate effectively in political choices that govern one's life; having the right of political participation, protections of free speech and association. (B) *Material.* Being able to hold property (both land and movable goods), and having property rights on an equal basis with others; having the right to seek employment on an equal basis with others; having the freedom from unwarranted search and seizure. In work, being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers.

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 the quality of life between nations. They also form a “partial theory of social justice” (Nussbaum 2000, 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 theorising. 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.

3. Methods

This article is based on qualitative field studies conducted from 2014 to 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, Devine-Wright, and Butler (2015). Despite 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 Valencia¹, 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 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 field notes, 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 six of these CC; however, all six 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 categorise 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 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.

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 multi-dimensional impacts of energy poverty and return to the point of the interrelation between capabilities in sections 5 and 6.

In the text that now follows, all interviewees quoted have been assigned pseudonyms.

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

Table 2. Overview of the prevalence of each CC.

Central capability	Specific impacts identified	Prevalence in data
Life	N/A	No evidence
Bodily Health	(Perceived) new or exacerbated physical illness	Medium
	Reduced consumption of freshly cooked hot meals	Medium
	Difficulties to sleep at night	Low
Bodily Integrity	N/A	No evidence
Emotions	Sadness, anxiety, fear, emotional distress	High
Affiliation (A): to connect and have interaction with other people	Social relationships within the home harmed	High
Affiliation (B) To be respected and to have the bases of dignity	Social relationships outside the home harmed	Low
	Stigma and embarrassment	High
Senses, Imagination, and Thought	Constraints on educational opportunities	Medium
	Constraints on having pleasurable experiences	Low
Other species	N/A	No evidence
Play	Opportunities for recreation at home reduced (watching TV, playing computer, reading books)	Low
	Opportunities for recreation outside of the home reduced (communal events, social clubs, societies)	Low
Practical Reason	Constant vigilance over energy consumption, domestic practices severely regimented	High
	Lack of opportunity to achieve wider hopes and life goals	Low
Control over One’s Environment	N/A	No evidence

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 (Nicolás³, 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 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; Oppermann 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 Porritt 2017; Sánchez, Mavrogianni, and González 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, Blow, and Crossley 2014; O’Neill, Jinks, and Squire 2006). Some interviewees (medium prevalence) confessed to reducing their consumption of hot meals (see Snell, Lambie-Mumford, and Thomson 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 of the 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, Gdansk): 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, White, and Finney 2012; Grey et 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, Gdansk), 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, Butt, and Tomaszewski 2009; Evans, Saltzman, and Cooperman 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 a lower motivation and task persistence than their counterparts living in better quality housing (Evans, Saltzman, and Cooperman 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.

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 Bartiaux, Day, and Lahaye 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, 219, emphasis added)⁵

However, our interviewees encountered severe 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, Gdansk)

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 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, 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 the 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 income 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 multi-dimensional 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. Multi-dimensional harms

Drawing on over 100 qualitative interviews, this paper has demonstrated that energy poverty can inflict harm upon human well-being in multi-dimensional 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. (2018), 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, Day, and Lahaye 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, Day, and Lahaye 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, Day, and Lahaye 2021 do discuss some similar issues, but consider these in terms of the CC of *Senses, Imagination and Thought*; however, in our view conceptualising 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 emphasises 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, 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, Day, and Lahaye 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, Day, and Lahaye 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, 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” (2011, 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, 6) argues that the CC can “provide a basis for central constitutional principles that citizens have a right to demand from their government” (Nussbaum 2000, 12). In practice, this also means that the material conditions necessary to achieve the CC are also basic rights (Nussbaum 2000). 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, Walker, and Simcock 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.

Notes

1. The Valencia sample was smaller than the other three cities due to 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.
2. Quotes translated to English from native language.
3. All quoted interviewees have been assigned anonymous pseudonyms.
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).
5. Sen (1999) has also suggested that freedom to plan one's own life is a crucial constituent of a decent life.
6. HUF = Hungarian Forint.

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