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Gender and energy: domestic inequities reconsidered

Saska Petrova ^a and Neil Simcock ^{a,b}

^aDepartment of Geography, University of Manchester, Manchester, UK; ^bSchool of Sciences and Psychology, Faculty of Science, Liverpool John Moores University, Liverpool, UK

ABSTRACT

Energy poverty is widely recognized as a problem that affects millions of households globally. Particularly in the 'Global North' context, research into this phenomenon has tended to treat households as monolithic units, with little investigation into whether and how energy poverty is differentially experienced *within* homes. We address this research lacuna by scrutinizing the gender dimensions of domestic energy use and deprivation. Drawing on extensive qualitative research in Poland, Greece and Czechia, we identify two ways in which energy poverty is differentially experienced along gender lines: household practices of responding to and resisting energy poverty, and the emotional labour of living with energy poverty. We also demonstrate how the negotiation of domestic energy deprivation can unveil not only gendered vulnerabilities, but also agency and emancipatory mechanisms. The paper thus provides insights that set an agenda for further research on gendered energy injustices beyond a simplistic, dichotomized victimization discourse.

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Género y energía: desigualdades domésticas reconsideradas

La pobreza energética es ampliamente reconocida como un problema que afecta a millones de hogares en todo el mundo. Particularmente en el contexto del 'Norte Global', la investigación sobre este fenómeno ha tendido a tratar a los hogares como unidades monolíticas, con poca investigación sobre cómo la pobreza energética se experimenta de manera diferente *dentro* de los hogares. Nos dirigimos a ese vacío en la investigación para analizar las dimensiones de género del uso y la privación de energía doméstica. Basándonos en una extensa investigación cualitativa en Polonia, Grecia y la República Checa, identificamos dos formas en que la pobreza energética se experimenta de manera diferente a lo largo del género: las prácticas domésticas de respuesta y resistencia a la pobreza energética, y el trabajo emocional de vivir con la pobreza energética. También demostramos cómo la negociación de la privación de energía doméstica puede revelar no solo vulnerabilidades de género, sino también agencia y mecanismos emancipadores. Por lo tanto, el documento proporciona información que establece una agenda para futuras investigaciones sobre las injusticias energéticas de género más allá de un discurso simplista y dicotomizado de victimización.

Genre et énergie : réexaminer les injustices domestiques

La pauvreté énergétique est largement reconnue comme un fléau qui impacte des millions de foyers dans le monde. Dans le contexte du 'Nord global' en particulier, les recherches sur ce phénomène ont tendance à aborder les foyers comme des unités monolithiques, avec peu d'attention portée aux différentes expériences de la pauvreté énergétique à l'intérieur des foyers. Afin de combler cette lacune, nous examinons ici la dimension du genre au sein de la consommation et de la précarité énergétique domestique. À partir d'études qualitatives approfondies en Pologne, en Grèce et en République Tchèque, nous identifions deux expériences distinctes de la pauvreté énergétique selon le genre : les pratiques domestiques en réponse et en résistance à la pauvreté énergétique, et le travail émotionnel de la vie quotidienne face à la pauvreté énergétique. Nous démontrons également comment la négociation de la précarité énergétique domestique peut certes révéler des vulnérabilités de genre, mais aussi des mécanismes d'action et d'émancipation. Les résultats de cet article ouvrent ainsi un programme de recherche sur les injustices énergétiques de genre par-delà le discours simpliste et dichotomique de la victimisation.

Introduction

Energy research in the Global North has been accused of being 'gender blind' (Clancy & Roehr, 2003; MacGregor, 2016), even though gender inequalities remain crucial in determining access to resources and the means of achieving well-being in many facets of life (Addabbo et al., 2016; Massey, 2013). Income poverty in the Global North is experienced differently between genders (Hall, 2016; Walker, 2014), and so it is logical to assume that this might also be the case for energy poverty, which is generally defined as the inability to attain sufficient levels of essential energy services in the home (Bouzarovski & Petrova, 2015). More broadly, 'the home' – the space within which energy poverty typically manifests and is experienced – remains often one of the most gendered spheres of society (Tjørring, 2016). Yet households or 'the home' tend to be conceptualized as homogenous entities in the energy poverty and fuel poverty literature. Energy poverty studies are not aligned with decades of research in critical cultural and feminist geography, where the home has been portrayed as a multi-scalar, porous, fluid and open space (Blunt & Dowling, 2006; Brickell, 2012b; Massey, 1992). This body of work has seen 'homemaking' as a process that is produced via multiple encounters and relations between human and other-than-human agents such as electricity, gas, pipes and lights (Gorman-Murray & Cook, 2017; Kaika, 2004).

We address the knowledge gaps noted above by exploring and elucidating the ways in which the lack of energy services in the home (Bouzarovski & Petrova, 2015) may be instrumental in the (re)production of gendered vulnerabilities in and beyond the home, in the case of affluent societies of the Global North. There is an immanent need to emancipate gendered energy vulnerabilities by linking the domestic and public geometries of power (Listo, 2018) as they are entangled in urban socio-environmental assemblages that incorporate circulations of energy and knowledge (Biehler & Simon, 2011). Homes – and by extension their social, political, and material interconnectivities – can be recognized as sites

of reproduction, transformation and innovation concerning energy resource use. More broadly, this opens the path for producing novel and systemic understandings of how urban energy circulations and metabolisms (Heynen, 2016; Heynen, Kaika, & Swyngedouw, 2006) affect, and are affected by, gendered energy vulnerabilities. It becomes possible to map and unpack the nuanced performativity of those vulnerabilities (Petrova, 2017, 2018) not only in homes, but also at the urban scale and beyond. Our investigation of these aspects is based on empirical findings from three in-depth qualitative studies of energy poverty focussed on Central, Eastern and Southern Europe – regions with some of the highest energy poverty rates in Europe (Bouzarovski & Thomson, 2018).

Before beginning, it is useful to define our understanding of ‘gender’. We follow Risman (2004) and conceptualize gender as a social structure that labels and legitimizes particular behaviours, roles and responsibilities as ‘feminine’ or ‘masculine’, which in turn works to ‘script’ and bound social action in various ways. Through people performing and acting in accordance with their ‘legitimate’ gender roles, the structure is remade (West & Zimmerman, 1987). By constraining and bounding human action, gender produces inequalities in what people can do, the resources and services they can access, and their opportunities for self-development (Nussbaum, 2000). This is not to say that gender is an omnipresent force determining all action; since human action can be reflexive, people can consciously seek to alter, remake or ‘undo’ gender structures (Risman, 2004). Gender is therefore not fixed but is continually remade and (re)negotiated, changing over time and varying depending on society, culture, class and tradition (Clancy & Roehr, 2003).

The text that follows begins with a critique of households as uniformed energy entities by reviewing the small body of literature that provides insights into gendered domestic energy poverty in the Global North. After the outline of our approach, we reflect on the empirical qualitative study. The main section of the paper presents evidence from our fieldwork, which identifies two ways in which energy poverty in developed countries is differentiated along gender lines: household practices of living with, responding to and resisting energy poverty, and the emotional labour of living in energy poverty. In the final section of the paper, we outline our conclusions and make a call for further research that builds on the gender dynamics of energy poverty in developed countries.

Global gender and energy inequalities

Energy poverty is widely recognized as a serious problem in many countries across the globe. Its implications include harm to people’s mental and physical health (Cecelski, Dunkerley, & Ramsay, 2015a; Marmot Review Team, 2011), social exclusion (Hills, 2012), and an inadequate ability to participate in society and live a flourishing life (Bouzarovski & Petrova, 2015; Day, Walker, & Simcock, 2016).

In low-income countries in the ‘Global South’, energy poverty typically manifests as a lack of household access to ‘modern’ forms of energy carriers, particularly electricity (Pachauri & Spreng, 2011, 2004), leading to a reliance on fuels such as paraffin and biomass for heating, lighting and cooking, which can be detrimental for health and well-being (Cecelski et al., 2015b). A substantial body of research has focussed on how such impacts are experienced unequally between genders, with women often enduring a greater proportion of energy poverty’s harmful consequences (Clancy, Ummar, Shakya, & Kelkar, 2007; Day, 2016; Sagar, 2005). Traditional gender divisions of domestic labour mean that women and girls typically

spend more time at home and cook most household meals, leaving them more vulnerable to the effects of indoor air pollution (Sovacool, Sidortsov, & Jones, 2014). Of the 2 million people that die annually from indoor air pollution, it has been calculated that 85 per cent are women and children (UNIDO and UN Women, 2013). Collecting biomass is also often the responsibility of women (Kaygusuz, 2011), and they can be required to do this for several hours each day, leaving less time for employment, education, and social and political interaction outside of home (UNIDO, & UN Women, 2013). Biomass collection can also be hazardous, due to injuries from carrying heavy loads (Masud, Sharan, & Lohani, 2007; Reddy, Balachandra, & Nathan, 2009) and, in some contexts, increased exposure to physical and sexual assault (Sovacool et al., 2014). Political recognition of this issue has led to the creation of initiatives such as the joint United Nations and World Bank programme, 'SE4ALL'.

Energy poverty also exists in the 'developed' countries of the 'Global North'¹, where it is often termed 'fuel poverty'. Here, an inability to attain adequate domestic energy services typically results from unaffordable energy services, rather than a lack of material access to electricity. Although emphasis typically is placed on space heating deprivation, recent work has suggested the importance of other energy services such as cooling, lighting, and ICTs (Bouzarovski & Petrova, 2015; Simcock, Walker, & Day, 2016). In Europe, research has revealed that this phenomenon is more prevalent in some countries and regions (Bouzarovski & Thomson, 2018; Healy, 2004; Thomson & Snell, 2013), and that the risk of experiencing the condition varies according to factors such as household income, energy efficiency, energy prices, and the particular (physiological, material, cultural) energy needs and requirements of individual households (Bouzarovski & Petrova, 2015; Buzar, 2007; Middlemiss & Gillard, 2015a).

However, a major limitation in research into energy poverty and vulnerability in the Global North context is that it frequently conceptualises and treats 'the household' as a monolithic unit. The discourse focuses on 'vulnerable households', with little unpacking of what occurs within the household space. As such, it fails to account for domestic power dynamics and the individual energy-related roles of household members in shaping vulnerability and the everyday experience of energy poverty. In short, potential inequalities *within* households are ignored – including, as we shall argue, those related to gender.

Gendered energy poverty in the Global North: setting a new agenda

The vast majority of the energy poverty literature in the Global North does not even briefly mention or discuss gender (notably, this is the case for review articles and reports e.g. Chesshire Lehmann Fund, 2016; Hills, 2012). Studies that examine inequalities in vulnerability to, or in the experience of, the condition tend to focus on other axes of difference, such as age, income, or health status. This is perhaps all the more surprising given that popular images and representations of the 'energy poor' could be argued to be implicitly gendered, as they frequently portray older people, and women especially, as particularly vulnerable.² Yet such portrayals often remain unspoken and have not been openly discussed.

Nonetheless, there is a small amount of empirical evidence – present as occasional mentions in articles that have a wider purpose and focus – that indicate that gender differences do matter for energy poverty in the Global North in at least three ways. The first relates to the prevalence and patterning of energy poverty. Some quantitative research in Europe suggests that gender can influence the likelihood of a person

experiencing domestic energy deprivation. Bouzarovski and Tirado Herrero (2017a) used EU Survey of Income and Living Conditions and Household Budget Survey data to estimate the extent of energy poverty in Poland, Hungary and Czechia. Their analysis discovered that, in Czechia specifically, households headed by women are disproportionately affected by energy poverty. A wider study by Bouzarovski (2015) also highlights the difficulties that older women living in Central European inner city areas face in terms of accessing infrastructural services. Petrova, Gentile, Mäkinen, and Bouzarovski (2013) used a representative survey of 3,000 people to examine perceptions of thermal comfort (taking this as a proxy for energy poverty) in the city of Stakhanov, Ukraine, and found that women were more likely to experience domestic thermal discomfort. In relation to pensioners, Healy and Clinch (2004) found that, in Ireland, a greater percentage of female pensioners (28.1%) suffer from fuel poverty compared to male pensioners (19.2%), and that this group is also more likely to be chronically fuel poor. More recently, Clancy and colleagues have examined how a lack of domestic energy creates gender inequalities in the European Union (Clancy et al. 2017). In their study (Ibid.) they have, for example, reported that 38% of the 5.6 million French households who declared being cold in 2013 are women-headed households, and more than a third of them are retired or in pre-retirement (Ibid.). In summary, there is growing evidence, in Europe in particular, that women are at increased risk of experiencing energy poverty. One reason for this may be that throughout the OECD women tend to have lower incomes than men (OECD, 2011)³, thus reducing the relative affordability of domestic energy and the ability to invest in energy efficiency improvements (Boardman, 2010; Bouzarovski & Haarstad, 2018; Bouzarovski & Petrova, 2015; Petrova et al., 2013). Female pensioners have been identified as particularly vulnerable to energy poverty for this reason (O'Neill, Jinks, & Squire, 2006; Wallis, 2004).

However, whilst structural gender inequalities in the likelihood of encountering energy poverty is an extremely important issue that warrants further research, it is not the focus of our paper here. Rather, we seek to understand how gender relations and inequalities mediate the *everyday experiences* of energy poverty. In short, we seek to unpack the idea of 'the home' as a homogenous space, and thus provide a more nuanced understanding of the lived reality of domestic energy deprivation.

A very small body of qualitative research indicates that this is a relevant and worthwhile endeavour. Some of this has focused on gender differentials in the subjective perception of domestic temperatures. For example, through qualitative interviews with older households, Day and Hitchings (2009) reported a perception that women tended to feel colder than men. Similarly, Wright's (2004, p. 494) interviews with elderly people living in energy poverty found that 'men were far more likely than women to say that they never felt cold', and that there were frequent tensions amongst married couples over the appropriate household temperature 'with a wife turning the heating up and a husband turning it down'.⁴ Cupples, Guyatt, and Pearce (2007) study in New Zealand suggests that this may be related to men's attempts to live up to stereotypes of masculine 'toughness', not wanting to appear a 'wuss' by turning up the home heating above a minimum level. Beyond perceptions of thermal comfort, Day and Hitchings (2009, 2011) also briefly mention subtle gender differences in the perceived stigma of various winter warmth behaviours, particularly around clothing. Wearing a hat to stay warm indoors or outdoors was considered out of bounds by their respondents, with women especially feeling that hats 'did not look good

and were especially detrimental to their hairstyling’ (2009, p.31). Some men were also averse to wearing hats, although for reasons of not wanting to appear ‘old fashioned’ or ‘too young’ (ibid.).

To summarize this section, a small amount of current research indicates that gender is a relevant and important dimension of study in relation to energy poverty in the ‘Global North’. First, women are more likely to live in energy poverty than men; second, the particular ways that the conditions is experienced by also differ along gender lines. However, the evidence base on this topic is currently very thin. By being the first article that is dedicated solely to the relations between gender and energy poverty, this paper therefore addresses an important research lacuna.

Approaching the gender and energy inequities in and beyond the home

Research reported here comprises data collected from two research projects that aimed to understand causes and consequences of energy poverty in Eastern, Central and Southern Europe (ECSE). We draw on in-depth, semi-structured qualitative household interviews with a total of 66 households recruited from three cities: Gdansk (25 households) in Poland, Prague (16 households) in Czechia, and Thessaloniki (25 households) in Greece. The country sampling was based on evidence suggesting that energy poverty is more prevalent and more severe in ECSE nations compared to Western and Northern Europe (Bouzarovski & Tirado Herrero, 2017b). The selected countries are relatively similar in terms of economic development, GDP per capita, and their Human Development Index score. There are also many differences between the cities and countries studied in terms of their culture, economy, and climate. This diversity has allowed us to conduct a comparison of the gender dimensions of energy deprivation by tracing connections (Hart, 2002), common themes and patterns that occur across the range of study contexts, thus giving the findings substantial validity and depth (Robinson, 2016).

Though we acknowledge the limitations of household interviewing in terms of interpersonal dynamics (Valentine, 1999), a household focus can nonetheless uncover the details and nuances of everyday shared domesticities and subtleties of gender norms, relations and inequalities within households (for example, Risman, 1999). Household interviews have also proven effective when examining how people adapt to, cope with and experience energy poverty (for example, Middlemiss & Gillard, 2015b). In recruiting our households, we did not seek to explicitly identify whether households were in ‘energy poverty’. Instead we aimed at diversity in terms of housing type, energy infrastructures, and household demographics. We adopted a purposive sampling methodology via a number of recruitment strategies including advertising leaflets and posters in public places and community centres, through contact with third-sector, housing and intermediary organisations working with disadvantaged or marginalised people, and via ‘snowballing’ in which we asked interviewees whether they would be willing to provide us contacts of other potential participants. All participants were provided with a project information sheet in their first language that detailed the aims of the research, the organisation of the research and what their fully voluntary participation would involve. Following this, participants signed a consent form confirming that they were happy to take part, to be audio recorded, and for their views to be used as part of this research.

Building on approaches used in ‘family studies’ (Valentine, 1999), we designed the interviews in a way that allowed all adult household members to be involved. The interviews were conducted in the first language of participants. All interviews were audio recorded, translated and transcribed, before being analysed using a thematic inductive coding approach (Braun & Clarke, 2006). Interviews typically lasted between 30–60 minutes, and covered a range of issues including participants’ perceptions of their home and its available energy services, energy bills and costs, and their everyday behaviours, responsibilities and decision-making in relation to various energy uses.

In conducting our data collection, we did not explicitly approach energy poverty through a gender lens. On the one hand, this could mean that some gender-relevant comments from participants may not have been probed as much in the interviews as they might have been if gender had been our specific focus when collecting the data. However, it is telling and very important that gender relevant comments and issues emerged ‘organically’ during our interviews, even though the questioning was not explicitly designed to elicit such issues.

From our analysis we identified two major themes relating to gender that were evident across the interview corpus: gendered household practices of living in energy poverty, and the emotional labour of living in energy poverty. The results are now discussed in relation to these two themes. When interviewees are directly quoted, pseudonyms are utilized in order to maintain anonymity.

Living with energy poverty: gendered household practices

Blunt and Dowling (2006) have developed a ‘critical geographies of home’ in order to unpack the complexity of ‘home’ as a material and imaginative multi-scalar nexus of power and identity (p.22). Thus, home is critical not only to the provision of care and production of well-being, but is also a space of multiple tensions (Addabbo et al., 2016), and an important location for the (re)production of femininities and masculinities (Hopkins & Gorman-Murray, 2014).

In the vast majority of mixed-sex households we interviewed, women undertook most of the domestic chores and care-giving duties. Some interviewees explicitly identified such tasks as ‘women’s work’. For example, describing her typical weekday, Agnieszka from Gdansk, a mother of two children in her early 40s, outlined a range of domestic chores she undertook, including cleaning, vacuuming, cooking and laundry, and described these as ‘typical women things in a household.’ Such findings echo decades of research into the gendered division of domestic labour, which finds that women generally spend more time on the routine ‘reproductive’ activities of housework and care-work (especially cleaning, cooking and laundry), whilst men are usually more responsible for non-routine home ‘maintenance’ (such as DIY projects) (Lee & Waite, 2005; Sayer, 2010; Tjørring, 2016). This division of labour has been critical in the traditional performance of femininity and masculinity (Gorman-Murray, Cook, Cox, & Buchli, 2017), and has remained relatively stable over time (Kan, Sullivan, & Gershuny, 2011).⁵

These gender divisions of labour played an important role in the negotiation of energy poverty in the everyday lives of those we interviewed. Previous literature has documented how households often adopt a variety of behavioural strategies in an attempt to cope with and adapt to the impacts of expensive bills or inadequate energy services (Anderson, White,

& Finney, 2012; Brunner, Spitzer, & Christanell, 2012). Such strategies can include reducing the amount of time that heating or other energy services are used, heating only a few rooms, or reducing spending on other essentials such as food. Our findings echo such literature – many of the vulnerable households we interviewed had implemented a range of measures that aimed to minimize their energy consumption, often involving alterations to everyday routines and practices. Importantly, however, we also found that the responsibility for such energy-related home (un)making (Baxter & Brickell, 2014) was differentiated between genders – and often unequally so.

Amongst mixed-sex couples, it was usually the female partner who undertook many of the ‘everyday’ alterations to routines or behaviours in an attempt to reduce energy consumption. For example, although Filip, from Gdansk, presented himself as the ‘manager’ of his household’s energy usage in the face of rising bills, it was mostly his partner Agata who undertook concrete actions to limit consumption: ‘When she cooks potatoes, she doesn’t use lot of water, only a small amount and pots accumulate the heat.’ Another case is Szymon and Hanna, a retired couple living in central Gdansk whose energy bills encompassed 12–15% of their income (more than 10% is commonly used as an indicator of energy poverty). To save energy, Hanna described how she had altered the way in which she conducted many of her everyday chores around the home, including limiting vacuuming to only once a week and using a broom the rest of the time, being careful with lights, and sometimes hand-washing clothes rather than using a washing machine. She also took great care to ensure the home’s radiators were correctly adjusted throughout the day:

‘I always turn-off the radiators – I get up, turn-off the radiator because in this room we do not sleep, so we twist it here. Here in the bedroom we turn all radiators off [...] The radiator is always turned on in the bathroom [...] I do all these steps, because our residential block is calculated by all residents’ consumption of heating’.

Other women included in our research reported a range of energy saving strategies which involved switching the *timing* of their household chores. This occurred specifically amongst those households who had a ‘time-of-use’ tariff for their electricity bills, in which they received cheaper rates for electricity consumed at particular times – typically either the weekend or overnight. The household of Agnieszka in Gdansk was particularly struggling because their energy bills encompassed around 1/3 of her income. In an effort to keep her costs to a minimum, she conducted many household chores at the weekend:

‘On Fridays from 8PM to Monday 6AM I have cheaper energy. In that case I generally do laundry on weekends. For me, this offer is interesting, because on weekends there is more time ... That’s when you could wash from dawn to dusk, wash everything. Because I have this electric kitchen hob, then you know most of cooking is at weekends, so that time I have a cheaper tariff too’.

Although Agnieszka did not complain about this routine, it can be argued that the necessity of washing and cooking ‘from dawn to dusk’ at weekends is nonetheless problematic as it constrains her opportunities for other activities, such as leisure.

In addition to such behavioural responses to the pressures of unaffordable energy bills, many participants we spoke to had also adopted energy efficiency measures, such as installing wall or roof insulation, purchasing more efficient appliances, or using low-energy light-bulbs. In most of the households we spoke to across all of the case study

sites, such measures tended to be seen as appropriately ‘masculine’ roles and so were therefore typically undertaken by men. For example, discussing energy efficient light bulbs, Eleonora, a young woman who was sharing a flat with two other friends from Thessaloniki, stated: ‘I don’t know much about it. When I had to buy the first light bulb, I had to make an effort. You know, I’m a woman. I’ve never had to do this, and while I did not need to, I did not think about it ... I always call my father [for advice]’. Meanwhile, Milan who shared an apartment with two flatmates in Prague, described with some pride how he negotiated with his landlord the change of the old inefficient boiler with a new one that improved the space heating and the thermal comfort in the flat: ‘The old boiler did not work all the time and sometimes it was below 15 degrees in the flat. I made some calculations and convinced our landlord that a new boiler would be better for all of us’. These findings are in line with earlier research into energy saving amongst middle-class households (Tjørring, 2016). It appears that energy saving measures that involve everyday behavioural adaptations are often considered a form of home ‘reproduction’ and so legitimately ‘feminine’ undertakings, whilst energy efficiency retrofits fall into the male realm of home ‘maintenance.’

However, the dominance of males in leading on energy efficiency improvements was no so clear-cut in every case. Amongst some of our participants, attempts to live with and resist energy poverty had led to a reconfiguration of ‘traditional’ gender roles. Thus, in several mixed-sex households, it was actually the female partner who appeared to take a stronger interest in, and have a greater knowledge of, energy efficiency, particularly relating to domestic appliances. For example, Zofia, who lived with her adult son, and was perhaps in the most severe energy poverty out of all the households in our Gdansk sample, had undertaken many DIY repairs and changes in an attempt to improve energy efficiency and thermal comfort, such as replacing the building’s roof and filling gaps in its outside wall. Describing repairs, she made to the windows, she stated:

‘The windows are old-fashioned. Three years ago my neighbour was in a nursing home, so he didn’t burn coal. I had cold walls and humidity appeared inside the windows. I repaired it a little, I had to scrape off this paint, put some anti-fungus mixture and paint it again. I am some handywoman, huh?’

The examples of Zofia and others clearly highlight the socially constructed nature of traditional gender roles. They demonstrate the potential for an ‘agency of empowerment’, by challenging essentialist stereotypes that women are invariably uninterested in, or incapable of undertaking, home maintenance or making energy efficiency improvements due to their ‘biological nature’. Home can also be a radical political space, a locus of contestation, protest (Blunt & Dowling, 2006; Brickell, 2012a) and rendering of alternative imaginaries (Kaika, 2004).

The entwinement of energy poverty with household gender relations also extended beyond issues of energy saving into other facets of everyday life – especially relations of care-giving. As noted above, in our sample such duties were primarily undertaken by women, and moreover sometimes stretched beyond the household and immediate family (Addabbo et al., 2016). Especially amongst the Greek households we interviewed, women were providing care not only to their children or dependent elderly parents, but also to grandchildren and neighbours. The value of such unremunerated care provided by female neighbours was significant in several household struggles with energy poverty. For

example, a dependence on informal care provision was one of the key reasons that kept families in rented properties that were energy inefficient and suffered from mould, damp and high energy bills. The situation of Adonia and Alekos, who were living with two young children in Thessaloniki was emblematic in this regard. Although in the extract below, Adonia refers to their 'neighbours' in plural, it was clarified later in the interview that they were talking about their female neighbour living next door.

I: Would you consider moving because of the situation?

Adonia: Yes, we discussed it at some point, to find a new flat with natural gas for heating.

But, there are other reasons, which deterred us from moving.

I: Like what?

Adonia: Like ... (laughter) It might sound silly ... Our relatives live outside Thessaloniki, we have two small children and we both work outside the city. We have very good relations with our neighbours next door. So whenever I need help with my little ones I can count on them. And this is one of the main reasons that we decided not to move'.

To summarise, our research demonstrates that the everyday strategies adopted by households living in energy poverty often take on a gendered nature. Attempts to control energy costs via adaptations to domestic practices (such as careful control and rationing of heating, lighting or domestic appliances) were typically undertaken by women, whereas making physical energy efficiency improvements to the home was perceived by some as a 'male' endeavour. It could therefore be suggested that women living without a partner may be more vulnerable to energy poverty if they have 'internalized' (Risman, 2004) cultural norms about energy efficiency being a 'masculine' area, and so are reluctant to personally engage with such measures. However, our research also indicates that such typical gender roles relating to energy efficiency may, in some energy poor households facing difficult circumstances such as financial pressure, be reconfigured. It is notable, however, that amongst our data this reconfiguration typically involved women taking on extra, traditionally 'male', responsibilities – for example, we found evidence of women in such households taking on duties or interests relating to energy efficiency in order to ensure the adequate reproduction of the home. This leads to a further point: our evidence suggests that females may bear the brunt of work necessary to ration energy consumption and navigate energy poverty. Nonetheless, it is also important to recognise that some of our female interviewees were proud of their roles as 'domestic leaders', and found being 'in charge' quite empowering. We return to this point in the next section.

Negotiating domestic comfort: the emotional labour of living with energy poverty

Living with energy poverty can be a highly emotional experience, as households that are unable to achieve their domestic 'ardent ambition' (Schröder 2006 cited in Brickell 2012b) of a comfortable, well-lit home encounter feelings of fear, shame and guilt (Hards, 2013; Hitchings & Day, 2011). Whilst such emotional impacts are well-documented in the current literature, our research reveals that their frequency and form is often differentiated by gender.

One way that this manifested was through the amount of time spent at home. As recognised by other literature in relation to older and disabled people (Snell, Bevan, &

Thomson, 2015; Walker & Day, 2012), amongst energy poor households those who spend more time at home may encounter more frequent and prolonged exposure to insufficient energy services, such as a lack of heating or lighting, and the harmful emotional and physical impacts that can result from this.

In our research, amongst households of adult couples *without* young children there appeared to be no consistent divide in terms of time spent at home – in some circumstances the female partners spent more time at home, while in other, the male partners were at home for longer – it depended mostly on employment arrangements; in some cases, for example, a male partner often worked from home during the daytime. For pensioner mixed-sex couples, the time at home again seemed to be relatively similar between genders. However, amongst adult couples *with* young children some clear gender inequalities were evident. Mothers tended to spend more time at home than the fathers because they usually undertook childcare duties, and so either didn't undertake paid employment at all or worked part-time to fit in with the school day. For households suffering from inadequate energy services, this could lead to unequal exposure along gender lines. For example, Petr and Marketa were in their mid-30s, and lived with their two small children in an apartment on the ground floor of a late 19th century building in Prague. Both had university diplomas, with the male partner working for the local municipality. Although they were not poor in income terms, their apartment received little natural sunlight due to the narrow streets, tall buildings and the fact that they live on the ground floor. Petr explained that he found the darkness of the apartment somewhat depressing, but admitted that his wife felt the mental and emotional impact more greatly because she was on maternity leave and so spent the days at home looking after their baby:

'I think it depends on your daily routine ... it is depressing to be at home with a small baby and it's dark during the whole day ... it affects your psychological stability ... if you are at work and spend more time there it's different, you do not notice it that much'.

In the case study countries, there are now more women in paid-employment than in past decades, and this explains the relatively equal time at home amongst adult couples without children that we found in our sample. However, caring for children remains a situation in which women conventionally take time out of the labour market and spend time at home. As the example of Petr suggests, in many countries this is institutionalized by the state through legal rights to maternity pay, which often cover only mothers (OECD, 2011). Amongst energy poor households, this may mean that mothers bear a greater proportion of the impacts of insufficient energy services.

As noted earlier, in our sample women were typically responsible for rationing the household's energy consumption through changes to their routines and activities, and moreover for undertaking many household chores whilst caring for children and dependents. Often, there was a tension between 'successfully' fulfilling these two sets of obligations – limiting energy or heating consumption, on the one hand, was not always conducive to ensuring the wellbeing of dependents, on the other. This situation could lead to feelings of shame or guilt. The situation of Daphne, who was living with and caring for her ill mother in Thessaloniki, exemplifies the difficulty of negotiating energy use and other household needs:

'My mother got ill in the winter and I thought that trying to economize on energy caused her to be ill. I felt extremely bad and very guilty. Obviously it is important to save up on energy, but I wouldn't 'kill' my mother just to economize'.

Iwona, who was living with her husband and daughter in Gdansk, described having sensitive conversations with her daughter about the importance of limiting energy consumption. This was described as a painful and somewhat upsetting task, which she admitted she only did out of necessity:

Iwona: When I am very upset that I have in one month higher bills than I predict, then I move onto the subject. I try to explain, of course, daughter, that in order to get to something that you have to do some expense. Parents also do not have it for free and also they did some expense to come to this, they refused itself this or that ... [...]

I: And are there some things that you would do more often if you do not need to save?

Iwona: Certainly I wouldn't walk through the apartment and turn off this or that permanently. I would not go to my daughter and say to her: please do not use your laptop when you watch TV'.

In order to manage such tensions, some parents would intentionally increase the use of energy services, most notably heating, when their children were around and then, in order to save money, reduce their usage when their children were not in the house (see also Harrington et al., 2005; Middlemiss & Gillard, 2015a). This was described particularly by single-parent households, which were, in-line with the OECD trend (2011), headed by women. Such actions probably reflect that these households were in the most severe energy poverty in our sample, a fact consistent with the wider literature (e.g. Petrova et al., 2013).

Overall, our findings suggest that women may encounter the emotional impacts of energy poverty more frequently than men. The continuous need to reflect upon, monitor and minimise energy consumption was a mentally draining activity, worsened by the fact that doing this was often in tension with other domestic responsibilities and wider societal expectations of being a 'good' mother, wife and daughter (Hong Fincher, 2014). Damara's reflection, a self-employed person who was living with her husband in Thessaloniki, expresses the pressure and critical self-reflection many women encountered when trying to negotiate the everyday life in energy poverty:

'I think I should try to become more resilient [...] I should get rid of my past needs because I think that some of them were unnecessary. Like for example to sleep with the heat on. This is something that I did without much thinking in the past'.

Although men were perhaps *less frequently* exposed to the emotional impacts of energy poverty, it is important to recognise that they nonetheless still encountered these. As noted earlier, in many of our interviewed households the interest and responsibility of male partners regarding energy saving often related to DIY alterations that improved the energy efficiency or thermal comfort of the home. This could be pressured and taxing experience, as men felt a sense of duty for ensuring the integrity of the home and the indoor environment, and disappointment if this was not satisfactorily achieved. Alongside efforts to reduce energy consumption, energy poverty can also force reductions in other areas of household consumption due to financial pressures (Anderson et al., 2012). This was particularly evident among the Greek households we interviewed, where the 2008 economic crisis and subsequent austerity regime has led to extreme hardship. This could lead to further experiences of shame and emotional upset amongst women and men alike, as they found they were no longer able to partake in valued customs and social activities. For example, Damian, a self-employed furniture

maker who lived with his wife and a small child in Thessaloniki described how he was no longer able to invite friends over to the house because 'the cost is high'. He further explained:

'You can't just offer them coffee or beer, you have to cook something or buy some kind of dessert to offer them ... We are trying to cover the basic bills, like pay for electricity'.

It is therefore clear that energy poverty can be an emotional experience for men as they strive to fulfil socially constructed norms of masculinity, particularly around successfully 'providing' for one's family and 'hosting' guests. Echoing Walker et al's (2013) argument in relation to other forms of hardship, an inability to achieve such norms, due to the constraints placed on everyday life when living with energy poverty, can result in feelings of stress, shame and even failure.

A final interesting point is that although the everyday negotiation of energy poverty was often an emotionally draining experience, for some women in our sample the responsibility for making energy savings was interpreted more positively as a form of domestic power. This was acknowledged by some male household members who described how their female partners regulated domestic energy consumption. Thus Alekos, a 44 years old truck driver from Thessaloniki noted that his wife 'pays for the electricity and controls when the lights are on or not [laughing]'. In other households from our sample, female interviewees described quite proudly how they took responsibility for managing their family's heating patterns. A number of studies have illustrated the complexities of the gendered, spatially distributed, character of power surrounding domestic work (Meah & Jackson, 2017). For example, Abarca (2006) has challenged the notion that cooking is necessarily an inferior domestic activity by explaining that cooking can be perceived as an affirmation of skill, knowledge, and identity – a transformative space to 'engage in their own everyday acts of agency' (Abarca, 2006, p. 22).

Conclusions

Drawing insights from the work undertaken by feminist and critical geographers of home (Blunt & Dowling, 2006; Brickell, 2012b; Cox, 2016; Hopkins & Gorman-Murray, 2014) this paper has demonstrated how the everyday experience of energy poverty in the Global North is often mediated and differentiated by gender. Thus, the paper challenges understandings of domestic energy deprivation as a phenomenon experienced and resisted by 'households'. Contrary to positing households as unified entities, we revealed that the ways energy poverty is experienced in the everyday is constituted by, and constitutive of, domestic gender relations. Energy poverty, in short, is interlinked with broader patterns and processes of gender inequality, as well as having the potential to produce new forms of such inequality.

Our analysis elucidated two major ways that gender is significant in how energy poverty is negotiated. Firstly in relation to the household practices undertaken to cope with and respond to energy poverty, and secondly in terms of the emotional consequences of living with domestic energy deprivation. We have elaborated how the lack of energy services and infrastructures in and beyond the home can unveil the porous nature of homes and render unfamiliar domesticities (Kaika, 2004) by evoking feelings of 'not being at home in one's own home' (Vidler, 1992, p. 4).

At the same time, our analysis also shows that disruptive events and forms of hardship, such as energy poverty, can reveal the socially-contingent nature of traditional gender roles, while challenging essentialist stereotypes and dichotomies. We have revisited the socio-

cultural aspects of the home as an energy ‘throw-togetherness’(Massey, 2013) by providing detailed qualitative research of how energy interactions between humans and infrastructures (re)produce uneven masculine and feminine energy vulnerabilities. Here, our key findings refer to the disproportionate responsibilities taken up by women in managing the consequences of energy poverty through multiple strategies and tactics. This situation has adverse consequences on women’s well-being, requires additional emotional and physical labour, and has implications for other forms of care-giving in the household. Nevertheless, energy poverty also redefines the socio-technical position of women in the home, offering new spaces for empowerment and reconfiguring existing gender relations. The (gendered) agency shown by household members in their attempts to overcome insufficient energy services questions common images of ‘vulnerable’ people as passive units at the receiving end of unjust state or corporate policy (Brickell, 2014; Gorman-Murray, 2017).

We end with a brief reflection on the political implications of our work and directions for future research. In terms of the former, the fact that energy poverty can create new spaces and relations of inequality adds a further political incentive for its amelioration. When delivering policies to reduce energy poverty, the issue’s entanglement with gender-related norms and behaviours needs greater attention. Nonetheless, we would caution against simplistic policies that reinforce conventional constructions about the appropriate roles of women and men in the home. Such strategies, although well intentioned, will ultimately lead to the reproduction and strengthening of gender inequalities – instead, there is a need to challenge and deconstruct contemporary gender differentials. Overall, there is also a need for further research into the gendered dimensions of domestic energy deprivation. We have shown the value of detailed qualitative research in revealing the nuances of energy poverty within the home. Further studies could undertake a similar research design, but place greater focus on unpacking differences in gender inequalities between varying socio-cultural contexts.

Notes

1. By ‘Global North’, we are referring to the ‘industrialized’ nations belonging to the Organization for Economic Cooperation and Development (OECD).
2. See, for example <http://www.montrosereview.co.uk/news/politics/third-of-north-east-families-suffering-from-fuel-poverty-1-4380241>.
3. This is partly due to women having lower labour market participation rates (in all OECD countries women’s employment rates are consistently below men’s, and a greater proportion of female employment is also part-time) and partly because women’s median wages are persistently below men’s (OECD, 2011, 2013, 2016).
4. Some research argues that biological differences are the reason why women prefer higher room temperatures (Kingma & van Marken Lichtenbelt, 2015; Yasuoka, Kubo, Tsuzuki, & Isoda, 2015). However, such arguments have been strongly critiqued for failing to account for the historical, socio-cultural and political construction of gender and thermal comfort (Chappells & Shove, 2005; Healy, 2008; Shove, 2003; Wilhite, 2009).
5. For example, Kan et al. (2011) found that although men’s domestic work time increased between the 1960s and 1990s in more economically wealthy nations, gender segregation in labour types has been quite persistent – women typically undertake more routine housework (especially with cleaning, cooking and laundry), while men have increased their contributions to non-routine domestic work (such as DIY projects).

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ORCID

Saska Petrova  <http://orcid.org/0000-0003-4731-8799>

Neil Simcock  <http://orcid.org/0000-0002-1408-962X>

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