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Is there evidence of households making a heat or eat trade off in the UK?

Carolyn Snell, Hannah Lambie-Mumford, and Harriet Thomson

Abstract

This paper explores the popular idea of a 'heat or eat' dilemma existing for some households. The mixed methods research finds that there is a relationship between not being able to heat the home and not being able to eat well. However, it appears that households struggle to do either, and there is considerable nuance in household decisions around energy use. Qualitative data analysis indicates the importance of energy billing periods, household composition and social and familial networks in terms of shaping household experiences and responses. The findings challenge the established idea that food and fuel are elastic household expenditures.

Introduction

In the recent years of welfare reform and austerity, few notions have been more emotive than the idea that people are forced to choose between heating their homes and putting food on the table. The idea of 'heat or eat' has gained significant momentum in the third sector, with prominent NGOs and charities running campaigns aimed at helping people overcome this dilemma; either through in kind assistance or anti-poverty work (Trussell Trust 2016, FareShare 2016).

Austerity policies, welfare reform and the rise of prominent charitable responses to poverty form the backdrop to the increasing focus on the 'heat or eat' dilemma. The UK's Department for the Environment, Food and Rural Affairs (Defra) (2014: 20) highlight that falling incomes and rising costs of living, including rising food prices, have meant that food is now over 20 per cent less affordable for those living in the lowest income decile compared to 2003. At the same time, there has been a high profile rise of food banks (Lambie-Mumford and Dowler 2014). In 2013-14 the UK's largest network of charitable food banks distributed nearly one million food parcels representing a 610 per cent increase in provision since 2011-2012 (Trussell Trust ND); this level of provision has since risen again to 1,182,954 parcels in 2016-2017 (Trussell Trust ND). In 2017 the Food Standards Agency released findings from their Food and You survey which measured household food insecurity defined as: "Food security' means having access at all times to enough food that is both sufficiently varied and culturally appropriate to sustain an active and healthy life' (Bates et al 2017: 26). This survey found that 13 per cent of UK adults are only marginally food secure and that 8 per cent have low or very low food security.

Whilst the affordability of food has traditionally been left by policy makers to the food and labour markets (with mitigation by social security where appropriate) (Dowler et al 2011) fuel poverty has been recognised by successive governments since the early 2000s. In the UK it is typically caused by a combination of high energy prices, low incomes and poor energy efficiency (Boardman 2012, Hills 2012) and leads to a situation where households spend a disproportionate amount of their income on household energy or ration their energy use (Boardman 2012; Hills 2012). The (former) Department of Energy and Climate Change (DECC) focused policy

attention on elderly people, disabled people and children given that these groups are regarded as most vulnerable to the health effects of living in cold damp homes (Marmott Review 2011). According to the official measure of fuel poverty in England rates have fluctuated between 2.41 million households in 2003, 2.57 in 2008, and the most recent figure of 2.38 in 2014 (DECC 2016). Following the re definition of fuel poverty in 2013 to the 'Low Income High Cost' (LIHC) measure, a greater emphasis has been placed on single adults and households containing children, as 'these groups represent a much larger percentage of the total fuel poor' (CSE 2014: 30). Whilst fuel poverty rates appear relatively stable under the new measure, there have been substantial changes to the availability of fuel poverty support. Alongside the broad range of austerity measures and welfare reforms introduced by the Coalition government, publicly funded energy efficiency schemes were abolished and financial schemes aimed at reducing energy costs for vulnerable households became substantially harder to access (Snell and Nordensvard 2016). Critics have suggested that the combination of welfare reforms, austerity measures, and specific fuel poverty policy changes have had a disproportionate effect on households that are of working age, that contain children, and people with disabilities (Kaye et al 2012; Wood 2011; Koh et al 2012; Snell et al 2015a; Snell et al 2015b, Disability Rights UK 2012)

Whilst the idea of 'heating or eating' has become a powerful rhetorical tool in the current era of austerity and welfare reform, which seems to resonate in the media and public spheres, there is very little empirical evidence available on the nature and scale of this household experience. Drawing on secondary and primary data, this paper critically explores the legitimacy and complexity of 'heat or eat' claims, with a particular focus on evidence of a relationship between food and fuel consumption and expenditure, and the evidence of a dilemma or tradeoff between the two.

Background

The fuel poverty literature has touched on issues relevant to the heat or eat debate. Existing research highlights how households experiencing fuel poverty undertake a variety of activities including: only heating one room, going to bed early, using extra blankets, spending time in local amenities in order to stay warm, and changing cooking practices to save energy (Harrington et al 2005, Gibbons and Singler 2008, Anderson et al 2012, Middlemiss and Gillard 2014). Moreover, the social cost of these practices is identified, described by Anderson et al (2012: 50) as 'a misery', where social isolation is exacerbated as a result of fuel poverty. The literature also highlights the impact of different methods of energy payment especially prepayment meters that often lead to households disconnecting from their energy supply (Middlemiss and Gillard 2014).

However, to date and despite the rhetoric, very little work has directly addressed the 'heat or eat' question, and the literature that does exist is almost entirely quantitative and is biased towards North America. Five quantitative studies have previously been conducted, with only one in the UK (Beatty et al 2014). Several additional pieces of research also make passing reference to the household food-energy relationship and tend to be focused on poverty (Barry et al 2005, La Grange

and Lock 2002), fuel/energy poverty (Anderson et al 2012, Hernandez and Bird 2010) and food security (Cook 2008, Dower et al 2011). The only directly relevant qualitative study is that of O'Neill et al (2008) who conducted 10 interviews with elderly people in the UK with questions focusing on fuel poverty experiences (e.g. feeling cold, worrying about heating), take up of policy support (e.g. insulation) and general questions about the importance of warmth to older people. Underlying most of these studies is the assumption that food and energy form both the largest part of expenditure after housing costs, and have greater and more immediate elasticity compared with other outgoings.

Most existing quantitative research focuses on proxy measures such as changes in household energy or food consumption or expenditure, or nutritional outcomes – when exploring the idea of ‘heat or eat’. To date evidence from this literature base suggests that poorer households reduce both food and energy expenditure as a result of price increases and that expenditure on energy falls as food prices increase (Murray and Mills 2012). Emery et al (2012) go further and suggest that changes in household food insecurity in Canada can be explained largely by energy price shocks. Several researchers also find a link between food expenditure and extreme weather with evidence to suggest that food security decreases amongst poor households during colder periods (Bhattacharya et al 2003; Beatty et al 2014, Nord and Kantor 2006). There is also evidence of a reduction in calorific intake during winter months (Bhattacharya et al 2003) and a negative relationship with weight gain amongst children (Frank et al 2006).

Of the few studies that have considered household experience and behaviour (rather than relying on proxies), Anderson et al (2012:44) found reductions in both food and heating amongst households in order to make ends meet. Whilst Anderson et al (2012) and O'Neill et al (2008) found that fuel was prioritised over food, Dowler et al (2011) and Hernandez and Bird (2011) highlighted cuts in energy spending to meet food bills. Whilst this suggests a complex set of decisions being made by households, the rationale behind these decisions remains unclear.

The existing literature is limited in several ways. Whilst the expenditure focused studies provide insight into overall patterns of spending and consumption, they are relatively disconnected from the actual day to day decisions made by households. Equally, whilst the experiential studies that suggest a number of different coping strategies and provide some reasons for these (for example, ‘the bills have to come first’ (Anderson et al 2012)), overall they lack detail and explanation. As such, there are clear gaps in our understanding of this issue, some of which this paper attempts to address.

Methodology

This paper forms part of a larger piece of research that explored whether the heat or eat dilemma discussed within policy debates really is part of the lived experience of poverty in the current era of austerity. Given the gaps in knowledge identified above, this paper focuses on several key aims:

1. To explore further the relationship between fuel poverty and food poverty;
2. To understand how food and heating costs are prioritised in household budgeting decisions;
3. To consider whether the concept of heating or eating reflects lived experiences.

The project methodology involved two main phases of research: desk based research including a literature review and secondary analysis; and primary research using qualitative interview methods with households and providers of food and fuel poverty services. Full ethical clearance for the primary research was obtained on 27/11/2014 from the University of Sheffield. Further detail is provided below relating to the literature review, secondary analysis and qualitative primary data collection; full methodological details can be accessed from the Authors' institutional websites.

Given that previous research has typically used expenditure data, the decision was taken to explore alternative ways of quantitatively exploring the food-fuel relationship. Data from the 2012-2013 Family Resources Survey (FRS) provided an alternative quantitative approach through its use of consensual measures. Consensual measures, often used by poverty researchers (e.g. Mack and Lansley 1985, Gordon 2006) and more recently used within fuel poverty, focus on perceptions and experiences reported by households rather than objective measures such as expenditure. Consensual measures of fuel poverty have been found to capture a very different population of households when compared to objective measures of fuel poverty, as one is based on technical information such as required energy spend, household income, and housing characteristics, whereas the other is based on lived experience (Fahmy et al 2011: 4376).

The FRS uses several established consensual measures of fuel poverty (see Thomson et al 2017 for an overview of these), and two questions around food consumption. The issue of household food security measurement is currently live in policy and academic debate (Hansard 2016; Lambie-Mumford and Dowler 2015). Whilst the Food Standards Agency and the FAO recently released results based on the detailed USDA measurement of food insecurity (Bickel et al 2000; Bates et al 2017; Taylor and Loopstra 2016), much previous and ongoing research has turned to proxy measures such as those listed below as representative of experiences of food insecurity (see for example Loopstra et al 2015). The FRS questions used within this project are listed in Table One. A number of fuel poverty questions are asked within the FRS and there are subtle differences between the questions asked to households containing at least one person of retirement age and those that do not. For example, 'Is your home kept adequately warm?' and 'Do you have a damp free home' are asked of households containing at least one person of retirement age whereas 'Can you keep comfortably warm in your accommodation during winter time' and 'Do you have Leaking roof, damp walls/floors, damp foundations, or rotten floorboards or window frames?' are asked of the larger sample. Crosstabulations and chi square tests have been used to consider the relationship between all food and fuel related questions with the most striking results summarised in Figure One (a

full account of the findings can be accessed at on the Authors' institutional websites). All results presented are statistically significant and generalisable at the national level. The fuel poverty indicators have also been used to develop a regression model predicting a households' ability to eat a meat or fish meal every second day.

Table One 2012-2013 Family Resources Survey food and fuel questions

FRS variable code	FRS question wording
OAMEAL	Do you eat at least one filling meal a day (asked to households containing at least one person of state retirement age)
EUMEAL	Are you able to afford to eat meat or fish (or vegetarian equivalent) every second day
COMCO	Can you keep comfortably cool in your accommodation in summer
COMWA	Can you keep comfortably warm in your accommodation during winter time
DEBT01	Behind with the electricity bill
DEBT02	Behind with the gas bill
DEBTAR01	Been behind with the electricity bill in last 12 months
DEBTAR02	Been behind with the gas bill in last 12 months
HOUSHE1	Are you able to keep this accommodation warm enough
OAWARM	Is your home kept adequately warm? (asked to households containing at least one person of state retirement age)
OADAMP	Do you have a damp free home (asked to households containing at least one person of state retirement age)
DAMP	Do you have Leaking roof, damp walls/floors, damp foundations, or rotten floorboards or window frames?

A case study approach was undertaken for the primary qualitative research. The case study was located in Cornwall and all research participants had access to the same forms of fuel poverty and food support. Semi structured interviews were held with nine regional stakeholders (comprised of public and third sector organisations representing public health, fuel poverty policy, food aid, and poverty alleviation). Interviews were also held with 11 individuals using four food banks in Cornwall, and with the four managers of these food banks. Of the individuals interviewed six were male and five were female. Five had children under the age of 16 who lived with them some or all of the time, and two lived alone. All interviewees lived in some form of rented accommodation, either in the private rented sector (PRS), or Social or Council Housing sector. All interviewees were partly or entirely reliant on social security at the time of the interview, with some receiving Job Seeker's Allowance (JSA) and others receiving Employment and Support Allowance (ESA). A summary table of interviewee characteristics is presented in Table Two. All names have been replaced to protect the anonymity of the participants.

Table Two Interviewee characteristics

Name (Gender)	Age	Employment status	Housing	Household composition
Steven (M)	Under 21	Unemployed	Sheltered	No children/HMO
Duncan (M)	Under 21	Unemployed	Shared housing	No children/HMO
Andrea (F)	Working age	Unable to work due to illness	Council housing	Single parent with resident children under 16
Peter (M)	Working age	Unemployed /some casual work	Private rented	Single parent with resident child under 16
Roger (M)	Working age	Unemployed/ some casual work	Private rented	Single
Rachel (F)	Working age	Unable to work due to illness	Housing association	Couple household with resident children under 16
Jane (F)	Working age	Employed on a variable hour contract	Council housing	Single
Sam (M)	Under 21	In training	Shared housing	No children/HMO
Dan (M)	Under 21	Unemployed	Sheltered	Non resident child/HMO
Laura (F)	Working age	Unemployed	Private rented	Couple household with resident children under 16
Christine (F)	Working age	Unemployed	Private rented	Single parent with part time resident children under 16

Interview participants were recruited through four food banks. This was largely driven by practical reasons and the researchers' established relationship with food bank organisations. There are of course limitations to this sampling strategy given that not all people living with food insecurity access food banks. But for the purposes of this project, this sampling strategy enabled the recruitment of a group of interviewees who provided detailed and much needed insight into the lived experiences of food and fuel poverty.

The purpose of the interviews was to establish how household spending was prioritised (via a household expenditure ranking exercise where all outgoings were ranked in order of highest to lowest priority), whether the heat or eat dilemma reflected lived experience, and to consider access to policy to support. The semi structured interviews drew on a Sustainable Livelihoods Approaches and budgeting interview techniques (see May *et al* 2009). The sustainable livelihoods method was adopted in light of the asset based approach it provides and the focus on developing a holistic understanding of participants' lives. The methodology had also recently been successfully utilised in another study of food bank users (Perry *et al* 2014).

Interviews were recorded and took between 40 minutes and two hours and were usually held in a private space in the food bank. Despite the sensitive nature of the topic participants were open about their circumstances (recruiting via the food banks may have enabled this given the screening process that individuals undergo before being referred for to food banks). Participants were reminded throughout the process that their participation was voluntary and that they could withdraw at any time. However, no specific issues arose during or after the interviews. A £15 supermarket voucher was given to all participants.

In analysing the empirical data a theoretically informed coding framework was drawn up based on structural drivers of household experiences (identifying issues of rurality, housing, income and family structures), and how interviewees experienced, adapted and made decisions within these structural contexts (health and well being, debt, food, fuel, social networks, state and community services). Evidence of specific 'heat or eat' trade offs were also identified. The coding framework was tested by two researchers, was subsequently refined, and then the data were analysed using NVIVO.

This methodological approach does have important limitations. Firstly, the secondary analysis of the FRS is limited by the available questions on food and fuel, alongside any limitations associated with the dataset itself. Whilst the questions are relatively limited, they provide an alternative approach to expenditure based surveys and are a recognised measure of both fuel and food insecurity (Loopstra *et al* 2015, Thomson *et al* 2017). Secondly, the low numbers of interviewees and the sampling of participants at food banks means that interviewees were experiencing a particular moment of crisis. However, given the sensitive and complex nature of these spending decisions, the vulnerability of the households in this situation, and lack of existing evidence about the issue, this element of the study attempts to provide some initial insights in the so called heat or eat dilemma. As such, it is the intention of this paper to explore the factors that may influence how and why households make certain decisions. Sampling via food banks both provided access to a 'hard to reach' population, but it also enabled households that were struggling to afford at least one of the two commodities to be identified.

Findings

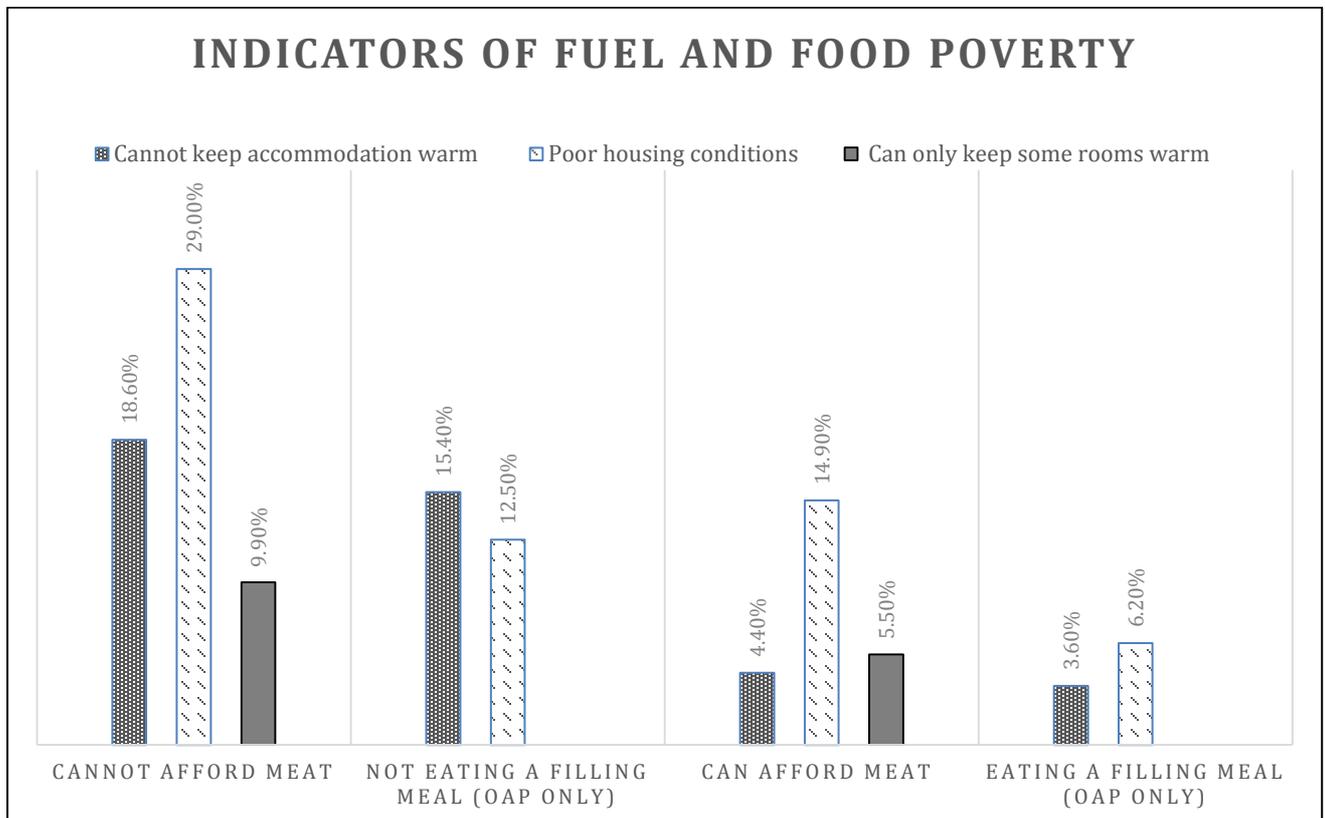
The findings section begins by presenting the statistical analysis from the FRS that offers an alternative approach to quantitatively understanding the food-fuel relationship. Following this qualitative results are presented, exploring how households make decisions around their food and fuel consumption and expenditure, barriers and drivers of this, and whether the 'heat or eat' dilemma reflects lived experiences.

Relationship between food consumption and indicators of fuel poverty

Several statistically significant relationships exist between the FRS indicators of food and fuel poverty and these are summarised in Figure One. The most striking relationships are between the two measures of food insecurity and the following fuel poverty indicators: being able to keep the home adequately warm (pensioners only), presence of damp (pensioners only), keeping comfortably warm in the winter, and presence of a leaking roof, damp walls/floors, damp foundations, or rotten floorboards or window frames.

Households containing at least one person of pensionable age were asked whether they ate a filling meal every day. Households that did not eat a filling meal every day reported increased prevalence of damp compared to households that did eat a filling meal (12.5 per cent compared to 6.2 per cent), and a higher proportion was unable to keep their home warm (15.4 per cent compared to 3.6 per cent).

Figure One: summary of the statistically significant relationships in the FRS dataset



Eating a filling meal and keeping accommodation warm enough : $X^2(1, N=8628215) = 33406.62 p <.001; \phi = .06, p <.001$. X^2 Eating a filling meal and damp conditions: $X^2(1, N=8628215) = 5876.77 p <.001 \phi = .03, p <.001$; Eating meat and keeping the house warm enough during the winter $X^2(2, N= 26541567) = 924418.56 p <.001$ Cramer's V indicates a.19, $p <.001$; Eating meat and existence of a range of poor housing conditions $X^2(1, N= 26631886) = 316319.90 p <.001; \phi = .11, p <.001$.

For households reporting that they could not afford meat every second day higher proportions were unable to keep their home warm in the winter (18.6 per cent compared to 4.4 per cent), and also reported higher levels of poor housing conditions (29 per cent compared to 14.9 per cent).

The likelihood of a household being unable to afford to eat meat, on the basis of various predictors, was calculated using a binary logistic regression (Table Two). Notable results include households in the lowest two income deciles, who are 6.3 and 6.1 times more likely respectively to be unable to eat meat compared to households in the richest decile. Households that are currently behind on their gas and/or electricity bill payments, or that have previously been behind in the last 12 months, or more likely to be unable to afford meat compared with households that are not in energy debt. Households that are currently behind on their gas payments are particularly at risk, and are 2.2 times more likely to be unable to afford meat. Similarly, households that report an inability to afford to keep their home adequately warm are 2.8 times more likely to be unable to afford to eat meat, compared with households that can afford to keep their home warm

Table Three: Logistic regression statistics

	B	S.E.	Exp(B)	95% C.I.for EXP(B)	
				Lower	Upper
Does accommodation have leaking roof, damp walls, floors, foundation (Yes)	.221	.002	1.248	1.242	1.253
Behind with the electricity bill (Yes)	.133	.014	1.142	1.111	1.173
Behind with the gas bill (Yes)	.783	.014	2.189	2.131	2.248
Been behind with the electricity bill in last 12 months (Yes)	.678	.008	1.970	1.939	2.001
Been behind with the gas bill in last 12 months (Yes)	-.361	.010	.697	.684	.710
Can you keep comfortably cool in your accommodation in summer					
No	.350	.005	1.420	1.406	1.433
Some rooms only	.320	.005	1.377	1.363	1.391
Can you keep comfortably warm in your accommodation in winter					
No	.248	.004	1.282	1.272	1.291
Some rooms only	-.022	.004	.978	.971	.986
Tenure					
Buying with the help of a mortgage	.071	.003	1.074	1.067	1.081
Part own, part rent	.685	.012	1.984	1.938	2.032
Rents	.689	.003	1.992	1.981	2.004
Rent-free	.364	.008	1.439	1.417	1.462
Household Composition					
Working age couple no children	.114	.003	1.120	1.114	1.127
Working age single with children	-.118	.004	.889	.882	.896
Working age single no children	-.229	.003	.796	.791	.801

Couple mixed age no children	-.429	.010	.651	.638	.664
Three or more adults no children	.512	.004	1.669	1.657	1.680
Three or more adults with children	.563	.004	1.756	1.741	1.772
Household Income Deciles (vs. Decile 10)					
Decile 1	1.840	.005	6.298	6.239	6.358
Decile 2	1.804	.005	6.071	6.012	6.130
Decile 3	1.232	.005	3.429	3.396	3.463
Decile 4	.792	.005	2.208	2.187	2.230
Decile 5	.823	.005	2.276	2.255	2.298
Decile 6	.331	.005	1.393	1.379	1.406
Decile 7	.301	.005	1.351	1.338	1.364
Decile 8	-.177	.005	.838	.829	.846
Decile 9	-.060	.005	.942	.932	.951
Are you able to keep your accommodation warm enough? (No)	1.025	.003	2.786	2.769	2.803
Constant	-3.827	.005	.022		

Note 1 $R^2 = .07$ (Cox & Snell), $.17$ (Nagelkerke). $p < .000$

Do households experience a heat or eat dilemma?

Neither heating nor eating: Rationing both

As with previous research (Anderson et al 2012, Dowler et al 2011) much of the evidence within the qualitative interviews was not of a binary 'heat or eat' choice, but instead reflected rationing expenditure on both food and fuel. In terms of fuel, there was evidence of people relying on blankets and extra clothing in place of spending additional money on heating (a practice mentioned by Duncan, Roger, Christine, and Andrea). Equally participants reported only heating certain rooms, only using heating when children were present, or only using heating for short periods of time, summed up by the following quotation:

'I'd love to have more heaters on in the house. Every time I have to go to the toilet, I have to gear myself up for ages because I don't want to have to go upstairs and then take a layer of clothes off' [Christine].

Similarly, all participants discussed the quality of the food they were consuming:

'I think everybody wants for a few more quid, but when you're wanting it for things that are a fridge full of food and some oil in a tank, and it's trying to get both rather than either-or...Because your diet suffers definitely, most definitely' [Andrea].

Resonating with the findings from the FRS analysis, several participants commented that their diets were not as they would like them to be, particularly lacking in fresh meat, fruit and vegetables. For many interviewees the foodbank and other emergency food support provided a buffer in terms of food spending, albeit one that was recognised as extreme and unsustainable.

Nuance of decisions: lighting, cooking and hot water above 'heating'

Where previous research has fallen short is to provide further detail and explanation for household decisions and behaviours around food and energy. One key finding of this research was that householders tended to prioritise energy uses such as lighting,

cooking and hot water above heating, suggesting a far more complex set of decisions being made than simply 'heat or eat'. When asked how they prioritised their spending on food and fuel, fuel was initially placed before food by most interviewees, but in the subsequent discussion most people said they would prefer to 'eat' rather than 'heat' and revised their ranking. These changes were largely as a result of different uses of energy - whilst most interviewees described being much colder than they wanted to, they regarded other uses of energy such as lighting and cooking as more important than heating. For example, Christine said that she wouldn't have access to her children if she didn't have lighting or wasn't able to cook; Laura described needing to use additional energy for laundry as her child had a bladder problem, and Jane commented '*As long as I've got electric, I can boil the kettle and I can have the lights*' [Jane]. Additionally, several participants described the importance of having gas or electricity for cooking:

'if you run out of fuel then I haven't got anything...I can't actually cook anything, so that will come before food' [Roger].

In the specific discussion around 'heat or eat' the overriding sentiment amongst households paying for their energy¹ was that food was a greater priority. Numerous respondents agreed that the phrase reflected their experiences.

The conditions that participants were living in were also discussed by participants and require discussion at this juncture. Three participants reported underlying health conditions such as asthma and pleurisy that they felt were worsening as a result of living in a cold, damp home (again, echoing the findings from the FRS analysis of a relationship between poor housing conditions and food). Furthermore, the stress of living with money problems and debt was mentioned by several participants:

'When we have got rent problems and bill problems as well, it kind of gets me down then. Last week I went and saw [manger] at the food bank and I was in tears because of it all. I suffer with depression anyway so it got to me a bit more' [Rachel]

Several respondents reporting embarrassment or shame because they had to ask for help:

'I first used them, I came down here [foodbank] about last summer some time. We got to the point where the cupboards were totally and utterly empty. I couldn't even get [my son] to school. It was embarrassing as hell. I had to take him up to school and ask the Headmistress, the teacher, if they could provide [my son] with a packed lunch because I didn't even have anything in the cupboard to do that' [Peter].

Mitigating and facilitating factors

The evidence also suggests that there may be particular mitigating and facilitating factors in relation to having to choose between 'heating or eating'. Fuel payment

¹ Those living in Hostel arrangements did not pay for the energy they used

method and billing periods, household composition, and social and familial networks appear to be very important dimensions to the 'heat or eat' dynamic.

One clear gap in knowledge in existing evidence is the impact of energy payment methods on food consumption and/or expenditure. Whilst there is a suggestion in the literature that the heat or eat trade off is more acute during periods of cold weather (Bhattacharya et al 2003, Beatty et al 2014, Nord and Kantor 2006) or when energy prices are high (Murray and Mills 2012, Emery et al 2012) only one piece of existing research (Beatty et al 2012) has considered the impact of *how* and *when* energy is paid for by a household. Beatty et al (2012) discuss a household's ability to 'smooth' (i.e. by making the same energy payment every month) costs over the year finding that the poorest households are unable to do this, and are most vulnerable to having to make 'heat or eat' decisions as a result. Where Beatty *et al's* discussion stops short is to consider different forms of payment method. There is a well-documented association between low income households and the presence of pre-payment meters (PPMs) in the UK (e.g. Davis et al 2016). Within this research almost all participants interviewed were on a PPM, and the decision to top up the PPM versus buying food was discussed on several occasions, with priority usually given to food. Several participants reported being disconnected from their energy supply for a couple of days if they could not afford to top up their meter. The effects of repaying energy debts through PPMs was also mentioned by several participants who commented that as money was put on the meter it was immediately reclaimed by the energy company (rather than being available for spending on fuel). This suggests an immediate 'top up or eat' situation, whereby householders reported having to choose between topping up a PPM or buying food.

For those paying for their energy less frequently this issue did not arise, however the impact of a large quarterly bill placed a much larger (but less frequent) strain on household finances. When Rachel's family received its winter energy bill the family often struggled to have enough food resulting in a visit to the food bank:

'Yes, we get given our bill and this one was £690 and then it is broken down over the next three months for what you pay until it is paid off. At the end of the three months whatever is outstanding we will pay a lump sum, which isn't very good because sometimes it can be £200. That is when we need help and we end up at the food bank' [Rachel].

For Rachel's family the effects of the quarterly bill meant that financial pressures occurred less regularly than other interviewees: *'I think if I was on a key meter then yes I would have to make that [heat or eat] choice'* [Rachel], but the consequence was a financial crisis at certain points in the year, especially following a cold winter. Equally, Roger reported a similar experience:

'I do try and keep my bills up to date so I am not chasing them all the time. Some weeks it is really difficult. When I first moved in there it was six months before I got a gas bill and it was £90-odd. I was like, "There is my giro gone." Obviously that affects you then for the next two weeks' [Roger].

Another interviewee, Andrea, relied on kerosene heating oil which could only be delivered in quantities of 500 litres or more, costing between £200-300. She found that saving up for this was difficult:

'normally I find it very, very hard to try and – out of weekly or monthly money – save up the money to get the £300 in advance for the delivery. So then obviously if I'm trying, like now, if I said, "Right I'm going to save for the next month to get this oil", if it gets cold and it's winter in the meantime between now and when I'm trying to save, I will dip into that money to put on extra electric to plug in more electric heaters to try and make my house warmer for the children, but then I'm in the trap that I'm not saving because I keep dipping into that money' [Andrea].

Once again this indicates the impact of billing periods on household finances, and the added complexities of living in a rural area.

In addition to systemic drivers described above, household composition and the strength of social and familial networks was also found to affect household experiences. Where there was more than one adult in the house there was greater ability to 'juggle' finances – for example offset bills against benefit payments. Where householders were alone, and especially if they had no familial or social network, they had fewer options during times of financial hardship. Interviewees that were able to draw on social or familial networks (within or beyond the household) described borrowing money for food, electricity or petrol, being fed or given food, using other people's hot water, or having essentials such as electricity or Broadband paid for by other people. Christine commented: *'I'll just leave the house for a couple of days and go and stay at a friend's house until I can afford to get electric'*. For others, the combination of a lack of support network, a preference not to ask for help, led to the extreme situation of having no food in the home:

'She [foodbank manager] she gives me food...like out of date stuff because she knows I won't ask unless I really need it. I would rather have nothing in my house' [Roger].

Other than relying on friends, family or formal modes of support, participants had turned to extreme measures in order to 'cope'. Andrea reported stealing *'I've shoplifted things to feed my child, my situation has been that bad'* to ensure that she had food, whereas Laura described having taken a doorstep loan in the run up to Christmas, and had just been dropped off at the foodbank by a debt collector. She was paying back the £200 loan at a rate of £10 per week for 12 months:

'We were really struggling, we didn't have any food, we didn't have anything, electric, gas or anything like that. It was just a door stop loan person knocked on the door with a leaflet and I was just like, "Come in, I need a loan." I was right at rock bottom then and I just thought I got to get it..., I took out the loan to secure everything and get obviously electric and gas and a bit of frozen food because obviously the Food Bank only do tinned, they don't do anything frozen' [Laura].

Discussion

This paper set out to explore the commonplace but under researched notion of a 'heat or eat' dilemma that has gained resonance in the recent years of welfare reform and austerity.

The existing literature is limited in several ways as it is largely based in North America and relies heavily on proxy indicators. Whilst existing experiential studies suggest a number of different coping strategies and provide some reasons for these, overall they have lacked detail and explanation. Given these limitations this research specifically set out to further explore the relationship between food and fuel; to consider whether the concept of heating or eating reflects lived experiences; and to understand how food and heating costs are prioritised in household budgeting decisions.

Investigating the food-fuel relationship further

As with the previous quantitative studies (Murray and Mills 2012; Emery et al 2012; Bhattacharya et al 2003; Beatty et al 2014, Nord and Kantor 2006; Frank et al 2006), the analysis of the FRS has suggested a relationship between fuel poverty and the consumption of food. This finding is broadly in line with existing studies, but offers a different, consensual based, insight to this relationship. In particular, the logistic regression shows that the odds of a household not being able to afford a basic meal were increased where indicators of fuel poverty were present, especially a household's ability to keep the home warm. The findings resonate with the heat or eat rhetoric, highlighting the struggle that householders are undergoing in terms of maintaining an adequately warm home and eating food that is sufficiently nutritious.

It is also clear from the regression model that the food-fuel relationship is closely related to income deprivation, a finding that is well versed within the food and fuel poverty literatures (Hills 2012, Lambie-Mumford and Dowler 2015). This has also been widely acknowledged by researchers considering the heat or eat dilemma, with the majority of studies starting from the premise that these decisions are made by those in the lowest income groups. The specific interest in these two commodities (rather than poverty more broadly) has arisen from their perceived elasticity when compared to other household expenses, with most existing research finding that it is the poorest households that adjust food and energy spending or consumption during times of economic pressure (for example during periods of cold weather or higher food prices). However, as discussed below, the qualitative evidence from this study suggests that the focus on expenditure and price based data favoured by previous researchers may be problematic as householders' experiences of this elasticity may be somewhat different to what the expenditure-based data utilised in the studies cited above, implies.

Also in line with findings from Anderson et al (2012), compared to fuel, food appeared to be a more elastic commodity that can be adjusted more easily, however, the interviewees tended to speak about the quality of the food that they consumed (something also echoed in the FRS analysis) rather than expenditure. Indeed, the situation the interviewees in this sample described was one of desperation where all possible financial cuts had already been made and where

emergency help was being sought (through the food bank, social or familial networks, or formal state support). Whilst the term 'heat or eat' had resonance with almost all participants, several made it clear that they could not afford to consume either commodity sufficiently. Whilst this is arguably a product of the sampling strategy, it also corresponds with recent research published by DEFRA that highlighted most significant changes in the nutritional content of food purchases in the second lowest income decile (purchasing 9 per cent less energy content in 2012 compared with 2007 – against a 3 per cent change in the lowest income decile), pointing to a distinct lack of elasticity for the lowest income decile, indicating that they have very little room for making cuts to/changing the nature of their food expenditure (Defra 2014).

Understanding how decisions are made

Aside from a statistically significant relationship between food and fuel being found, the qualitative dimension of this study suggested a dynamic and varied relationship between the two commodities that is very difficult to capture quantitatively. The findings suggest that a variety of factors shape household decisions and experiences, these include household composition, social and familial networks, and specific structural factors relating to the energy market.

A number of structural factors influenced the decisions households made in terms of their spending (rather than this being a straightforward rational decision about making financial savings). Energy payment method, being off the mains network and being reliant on alternative forms of fuel such as LPG, the presence of energy debt, billing errors or delays all affected how the householders in this study used energy and engaged with its cost. Taking energy billing periods as an example, this research found that household experiences and decision making varied depending on how much and how often energy payments were required. As highlighted by Beatty et al's (2014) research a household's ability to 'smooth' energy costs over the course of the year had a positive impact on food security. In the case of our research, paying for energy irregularly led to two distinct situations. Whilst PPM users often balanced energy costs with other outgoings on a weekly basis regularly resulting in self disconnection for short periods, those paying quarterly described a temporary financial crisis, resulting in seeking emergency support (such as food aid).

Whilst structural factors shaped our interviewees' interaction with energy use and expenditure, they actively made decisions about how to use this energy. Different types of energy use were prioritised, with lighting, cooking and water heating chosen over heating, and in fact, all participants reported living in cold conditions (with a suggestion of this also found in the FRS analysis). The presence of children and other adults in the home, and social and familial networks also influenced *how* and *when* food and fuel were used, for example, parents looking after children for parts of the week reported rationing energy for these visits; heating was only used when children were in the house; meals were provided by friends and family; washing and bathing took place in other people's houses; and household members borrowed from each other.

Is the heat or eat dilemma a helpful concept?

As fuel and food poverty researchers we find ourselves with a dilemma of our own – whether there is merit in pursuing the heat or eat concept further. On the one hand, this research has a number of limitations. The quantitative data presented in this paper is based on secondary analysis and, as with other research, has relied on proxy measures. Equally, the qualitative analysis is based on case studies in one rural area, with households experiencing some form of crisis. Further primary research with a larger, broader sample (both quantitative and qualitative) could substantially develop the exploratory findings presented here. However, for meaningful research to be conducted in the future, researchers must recognise the limitations of both working with expenditure/consumption data and making the assumption that food and fuel are elastic commodities. The findings here have demonstrated the role of structural factors in determining the choices available to a household, have suggested that households may be in a position where they cannot make any further spending cuts, and that existing levels of spending or consumption may be unhealthy or dangerous. These factors must be recognised by future research, rather than masked by it.

On the other hand, whilst as a phrase the term ‘heat or eat’ appears to resonate widely, as a policy problem and focus for community activity and response, the exact nature of this experience is far from clear – neither in theoretical nor empirical terms. Neither concept adequately captures the dynamics of this particular trade off. As such, it has become apparent that there is a lack of theoretical basis for the ‘heat or eat’ concept. Given the severity of the circumstances that this experience incorporates, it could be argued that the most appropriate way to conceptualise ‘heat or eat’ is in the context of destitution. In the UK the current working definition is:

‘people are destitute if: a) they, or their children, have lacked two or more of these six essentials over the past month because they cannot afford them shelter, food, heating, lighting, clothing and footwear, and basic toiletries or b) their income is so extremely low that they are unable to purchase these essential for themselves’ (Fitzpatrick et al 2016:2).

A focus on destitution might be more useful than the heat or eat dilemma as it is broader in focus and is likely to capture the nuanced relationship that households have with food and fuel. Furthermore, it enables analysis of food and fuel to be put into the context of spending on other commodities regarded as an essential part of everyday life (such as toothpaste, toilet paper, or sanitary products) that may also impact on energy and food expenditure and consumption.

Conclusion

In summary, empirical analysis revealed a desperate situation where some households were regularly unable to afford sufficient energy or food. The evidence presented above suggests that it is very unlikely that there is a straight choice made between energy and food, instead, rationing of both is more likely. The qualitative

analysis suggested a nuanced set of decisions being made around different types of energy use, and responses being shaped by household composition, social and familial networks, and specific structural factors relating to the energy market. However, whether this can or should be presented as a 'heat or eat' dilemma requires more detailed investigation and discussion around its true reflection of these experiences and its utility in furthering effective policy responses.

On the basis of the findings presented here, we recommend that future research projects take into account several points. Future research will need to take adequate account of the nuances of people's experiences and the risks of using expenditure data. This research involved a small sample, talking to people in crisis; if there is value in more research on the topic then the limitations of this study need to be overcome. Assuming elasticity exists in household budgets is dangerous for those who are in the lowest income groups. Researchers will need to be careful about what assumptions are made around elasticity and what household items are essential or non-binary. Other items may be considered essential – for example – sanitary products and these will also be factored in to household spending decisions. In light of this, adopting a destitution framing might assist future research in adopting a more realistic idea of the pressures on a household budget.

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