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CONSUMPTION \neq BEHAVIOUR

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ABSTRACT

This paper, intended as a literature review of energy behaviour studies, was produced as a component of my comprehensive exams. It provides a critical review of the ways in which energy behaviour has been conceptualized in this literature and highlights the insights from these studies, while suggesting that a practice theoretical approach to the study of energy use might be more appropriate for the understanding of household energy use than approaches that equate behaviour with consumption and expenditure.

1. THE HUMAN DIMENSION!

'Energy use behaviour', 'social and behavioural aspects of energy use' and 'the human dimensions of energy use' are various labels applied to a body of research covering such diverse topics as economic investment decisions around the purchase of energy-saving/consuming technologies, socio-demographic determinants of energy use, cross-cultural examinations of energy using practices, and psychological explorations of beliefs and attitudes towards these practices. Energy use behaviour research, in fact, seems to cover all that could not be explained by the predominantly technical paradigms of energy research in the 1970's and 80's; and has its genesis in these researchers' realization that their conceptions of household energy use -in terms of housing features, appliance stocks, and efficiency ratings- failed in explaining large variations in energy consumption in houses of similar construction. In response to the findings in the often-quoted studies of Socolow (1978) where variations of over 100% were found in seemingly identical housing units, a 'behavioural' dimension (later even more broadly labeled 'human dimension') was hypothesized for household energy use and social scientists were enlisted in explaining these 'social', 'cultural', 'behavioural' and 'human' dimensions of energy use.

In their piece on the legacy of 20 years of energy demand management, Wilhite, Shove, Lutzenhiser and Kempton trace the trajectory of social scientific work on energy use, highlighting the early prominence of psychological research on energy, and the consequent focus on behaviour research and the individual as the unit of analysis (Wilhite, Shove, Lutzenhiser, & Kempton, 2003). The focus on the individual was, of course, questioned by researchers in this field prior to the Wilhite et al piece, and as a result several lines of research developed covering disciplinary approaches such as economics, sociology, anthropology and psychology, and

various units of analysis ranging from the individual, to household, to institutional. Furthermore, several integrative models of household energy behaviour have been proposed, attempting to account for individual psychological variables, household negotiation and decision making processes, policy and regulatory regimes and social and cultural norms. More recently, studies of household energy use have drawn inspiration from theories of practice, generating accounts of how energy-consuming activities are variously enacted both over time and in fulfilling different functions.

This large and diverse body of work can be, and often is, delineated along disciplinary lines, methodological ones (qualitative or quantitative approaches), or based on the unit of analysis and source of agency (individual, household, social, structural, infrastructural). In this review, while I will address these distinctions, I want to focus particularly on yet another possible delineation, namely one that distinguishes studies based on their conception of energy consumption. I will argue that much of the literature on household energy 'behaviour' (and I'm almost ready to lose the quotes), analyzes behaviour through the lens of consumption, as an aggregate whole that does not take account of the heterogeneity within the various activities that make up the aggregate. Furthermore, this almost monolithic consumption, is either taken as a proxy for behaviour or more abstractedly, as an expression of intention, agency or some understanding of class or lifestyle. Highlighting the ways in which energy consumption has been conceptualized, I will question whether it has been useful to analyze 'behaviour' through this lens, and more importantly, whether consumption can be taken as a proxy for or expression of energy consuming actions or intentions.

I make this particular distinction for a number of reasons pertaining to the history and trajectory of social science research on household energy use: As I have already mentioned, social science research on energy use was born out of the realization that purely technical understanding of energy use in terms of efficiencies and technologies had largely failed in explaining variations in energy demand. Social scientists were, therefore, recruited to explain this variation. With much of the early research in this field being practical and policy minded, this task of explaining demand/consumption was, by and large taken up in the social scientific research agenda without much question.

Having taken up this research agenda has had curious implications for the kinds of questions this body of research attempts to address. Wilhite et al (2003), for example, note the limited role

that the 'human factor' terminology allows the social scientists engaged in energy studies to play, arguing that framing social scientific research as one concerned with understanding why techno-economic models fail diverts it into an "exercise of barrier analysis" (p. 114). Henning (2005), likewise, argues that this default research agenda has led to social scientists often playing a supporting role to other researchers. Detailing her engagement with energy policy research in Sweden, she describes how in this supporting role she constantly found herself trying to tailor her research process so that it would fit into the timescale of a technical project with a prescribed agenda, often excluding opportunities for exploring understanding the contextual variables that play a key role in shaping energy using practices (Henning, 2005, p. 11).

Here, my argument is not with regards to the potential role of social scientists in energy studies. Rather, what I want to emphasize is that taking up the agenda of explaining the 'human factor' has lent social scientific research in this field a particular lens – one that often focuses on explaining the end-user's energy consumption -whether with regards to the acquisition of energy consuming technologies, or more pertinently in this case, their energy demand- as a more or less monolithic variable viewed as an outcome of various social and psychological processes, rather than as one that is composed of heterogeneous forms of consumption incurred as part of different activities, each of which is governed by various internal logics that can not be aggregated. In other, less abstract, words, total household energy consumption, measured in gigajoules or kilowatt-hours conceals the make up of this variable as a multigenic one, composed of consumptions incurred in processes of cooking, heating, showering, doing laundry, etc – each governed by different and often inconsistent internal logics and narratives. As I review the research on the so-called behavioural aspects of energy, delineated along the lines of treatment that the notion of consumption receives in this literature, I will discuss why this latter view might be more conducive to understanding household energy use.

The reader will notice that I have played (and will continue to play) fast and loose with terms like behaviour (but also, lifestyle and culture). In part, this use is reflective of a literature marred by imprecise terminologies and a shaky theoretical ground, dispersed across different disciplines. To clarify, I use the term behaviour (or energy behaviour, in this case) in the broadest sense possible to mean all actions and decisions (less so sayings) that have direct energy consuming consequence. In this sense, energy behaviour would describe the ways in which households partake in activities such as washing the dishes, doing laundry, heating spaces, and purchasing

energy consuming equipment. Through the course of this discussion, I hope it will become clear how this definition differs from some of the ways the term has been discussed in the literature, especially the psychology literature where it is closely linked to individual beliefs and actions and appears to be governed by 'behavioural processes', as something distinct from social ones.

I will begin by reviewing some of the major themes discussed in the literature on household energy use, making explicit the ways in which this literature conceptualizes energy consumption. Then, following a discussion on the limitations of these conceptualizations of energy consumption, I will engage with a more recent body of work on household energy use drawing inspiration from theories of practice. I will, finally, discuss the implications of this view for doing research on household level energy use.

2.0 AN ALMOST COMPREHENSIVE REVIEW OF HOW PEOPLE THOUGHT ABOUT ENERGY BEHAVIOUR, 1970s-1990s

2.1 Money matters

The role of energy prices and payment structures in mediating energy consumption is a common theme of discussion in the literature on household energy use. Two "natural experiments," in particular, have provided scholars with the opportunity to investigate how price signals affect energy consumption: One set focuses on the differences between energy use in rental units where the cost of utilities are included in the rent and in those that pay for their own energy bills. The other investigates differences in energy use in master-metered apartment buildings and in those where each unit receives their own bill. Taken together, these studies suggest that economic arrangement around forms of billing and payment for energy do affect energy-relevant conduct, specifically around thermostat setting. In an analysis of the data available in the RECS database, Levinson and Niemann (2004), for example, find that rental units that do not pay for utilities separately tend to set their thermostats to higher temperatures than those that do. This difference is especially pronounced in the reported thermostat settings when no one is at home (2 degrees higher for those who don't pay for utilities separately). These results suggest that tenants whose rent covers the cost of their utilities employ higher thermostat settings (but not necessarily use more energy) and turn back thermostats less when they are away from home. However, the authors find that these higher thermostat settings amount to no more than a 1.7% increase in energy costs (and therefore consumption), suggesting that though the direction of causality is not certain, including utilities in the rent might be acting as an incentive for the landlords to upgrade the efficiency of their units.

Though, these results suggest that payment mechanisms do affect the way households behave (by choosing higher thermostat settings, for example), they also highlight the importance of making a distinction between ‘behaviour’ (thermostat setting) and ‘consumption’ (total household demand). This distinction is important because the actions and behaviours that determine energy consumption are mediated by technologies and material (in this case thermal insulation and heating system efficiency) that have a significant influence of their own on the process and may obscure the significance of the ‘behavioural input.’ This is a point I will return to again and again in this paper as I critique the use of consumption and expenditure-based indicators in studies of energy ‘behaviour’.

Carlsson-Kanyama and Lindén (2007), in a study of the participants of a Swedish energy conservation program that converted master-metered apartments to unit-metering, likewise, find that the inhabitants of these newly metered apartments reported lowering their thermostat settings¹. They find these reports significant when they compare these results with those of their earlier study of apartments with master-metered units where they found that few households lowered indoor temperatures at night or when leaving their apartments (Carlsson-Kanyama, Lindén, & Eriksson, 2005). The authors, thus, conclude that given the right incentives substantial behavioural adaptation is possible around household energy habits.

The most important study of changes in energy consumption in the aftermath of a change in metering and billing arrangements is the often-quoted work of Hackett and Lutzenhiser (1991), in which they monitor changes in individual units’ demand for a period of 3 years centred around the change in billing method. One of the unique aspects of their study is that the units in the apartment complexes under study had always been metered separately, but received communal bills nonetheless. The authors, therefore, could compare the demand after each unit began receiving bills based on their own consumption to the demand when the communal billing method was used – something that studies of master to unit-metering changes cannot typically do (they rely on aggregate building changes, instead). They found an approximate 50% drop in consumption (in both groups with high and low consumptions) after the conversion to individual billing, and suggest that this drop can be interpreted in the traditional economic sense:

¹ While this study did not monitor energy consumption in the apartment buildings before and after the change in metering, they reference a study (Berndtsson, 2003) that reports a 10-20% reduction in heating energy use and 15-30% reduction in hot water use, though it is not clear whether the reported reduction is for the buildings in Carlsson-Kanyama’s study or for all buildings retrofitted. The original being in Swedish, I take those numbers with a grain salt.

under master metering, the marginal cost of energy is essentially zero; the cost of every new unit of energy consumed by a particular apartment will be spread over all of the apartments and therefore not experienced directly by the consumer- an invitation, it might be concluded, to high and perhaps wasteful consumption (Hackett & Lutzenhiser, 1991, p. 455).

But the authors also offer an alternative interpretation that views this change in the billing method as one with consequent changes in the social roles ascribed to the building inhabitants: the buildings in this study were graduate residences on a university campus for whose inhabitants master metering functioned as “a kind of halfway house between parental provision and payment for services on the one side, and a private unmediated contract between consumer (here, a “customer”) and vendor on the other” (Hackett & Lutzenhiser, 1991, p. 461). The switch to individual billing, they argue, changes the inhabitants role from a “ward of the university” to a “customer” for whom economizing is a prescribed feature of the role. This view of consumption, as embedded within social roles is one that economic sociologists advocate, where economic behaviour, itself, is seen as “a mode of cultural conduct and social performance that approximates a shifting and evolving set of ideas and norms regarding just what “economic” behaviour and success consist of.” (Biggart & Lutzenhiser, 2007, pp. 1083-1084). In this view, altering billing arrangements and prices change household consumption because they signal a change in the social roles ascribed to individuals and households, requiring different enactments of energy consuming practices.

Overall, the research reviewed here, focuses primarily on the use of monetary incentives to change consumption and energy consuming conduct. As mentioned already, some of these studies make a distinction between aggregate consumption and more specific energy-consuming actions like thermostat setting, while others seem to take aggregate household energy consumption as a proxy for behaviour or conduct, which they view as socially-situated. In both cases, however, billing arrangements are reported to either significantly affect behaviour, or consumption, though none of the studies on the subject explore how changes in billing arrangements affect different categories of consumption, in a sense, remaining silent on how different energy-consuming actions such as heating might be governed by different economizing (and otherwise) logics than, say, the use of hot tubs.

2.2 The information business

Research in psychology, on the other hand, queries the assumptions embedded in the economics view of the relationship between price and demand by problematizing the ways in which information embedded in price might enter consumers' awareness and questioning how this awareness might affect action (Stern, 1986). In this research tradition, price (and more broadly, information) is seen as multi-dimensional, so that the ways in which information and price are communicated become integral parts of the analysis (Stern, 1992). In fact, there is a large body of work focusing solely on the frequency with which energy costs are communicated with energy consumers. These 'feedback' studies range from investigations of how more frequent or informative bills influence energy consumption to those that look at the effects of real-time feedback on total household consumption or consumptions of specific household appliances.

Energy conservation as a consequence of changes in 'indirect feedback' (or how information on bills are presented to and communicated with consumers) are common in this body of literature. Wilhite and Ling (1995), for example, report 10% lower energy consumption in households that received a 'redesigned' bill compared to a control group. In their redesigning of bills, the authors simplified the layout of the billing information, presented comparative feedback on how the household's consumption had changed relative to the year before, provided energy saving tips and most importantly, increased the frequency with which households received bill. These energy savings relative to the control group gradually increased over the first year, eventually reaching the reported 10%, which was sustained over the next two years in the study. However, in considering studies of this kind, it is important to take into account the initial conditions from which bills were changed. In Wilhite and Ling's sample, for example, households received quarterly bills of equal amounts regardless of consumption, and only once a year paid for any difference between actual consumption and the billed amount. The change to monthly, consumption-based billing in the study was, then, a drastic one. More recent studies on indirect feedback (with less drastic changes in billing arrangements) report less savings; and in fact, in Darby's (2006) review of the literature on billing feedback, Wilhite and Ling's value falls on the high end of a reported range of 0 to 10% relative reductions in energy consumption as a result of more informative bills. Review studies such as Darby's, however tend to shy away from discussing the reasons for the wide range of results reported in the literature.

Another commonly debated idea in the literature on billing is the effect of including comparison information on the bills. As mentioned above, a common comparison option is historical comparison, so that the bill provides information on how the household's consumption has changed relative to a similar period in previous years. Alternatively, some suggest providing comparisons with other consumers, based on similarities in housing types, dates of construction, street address, etc. Iyer et al (2006), for example, recommend using street addresses and a comparison bar, similar to that of EnerGuide, to indicate the range of variation in consumption on a street block and locate the households' place within that range. It should be mentioned, however, that their recommendations is based on an analysis of utility data that considers the quality of comparison based on statistical properties of distributions obtained from each potential comparison group and not on the basis of costumers response to such information. Focusing on this latter dimension, a series of focus groups led by Roberts et al (2004) found that consumers preferred historic feedback over comparison groups. In a similar vein, studies by Haakana et al (1997, qtd in Darby, 2006) and Egan (1999, qtd in Darby, 2006) found that while households are typically interested in comparative feedback, they will not necessarily reduce their energy use when this normative kind of feedback is provided to them. This result is often explained by noting that while high users might be induced to reduce their consumption based on this kind of feedback, low users may well increase theirs, with the resulting net effect being neutral (Darby, 2006; Fischer, 2008). But the literature, again, shies away from exploring disaggregate data that might test this hypothesis.

Beyond studies of billing arrangements (indirect feedback), the feedback literature engages with the effectiveness of providing direct feedback to households on their consumption. Since a detailed review of the feedback literature is beyond the scope of this paper (and my interests), I will instead primarily draw on existing reviews of this literature (Darby, 2006; Fischer, 2008) in highlighting the insights of this body of work. Direct feedback is usually associated with providing consumption information using a display, which may or may not provide information on the energy use of specific household appliances. Nonetheless, reviews of this type of studies have found that direct feedback seems to result in energy savings in the range of 5-15%, with most successful interventions displaying several characteristics: 1) relying on some interactive element that engages the household, 2) using digital displays, 3) including energy saving tips and advice, 4) providing feedback daily (or more frequently) (Darby, 2006; Fischer, 2008). Qualitative accounts by Brandon and Lewis (1999), on the other hand, point to the role of the digital display, itself, in serving as a point of disruption in energy use habits. This observation

might suggest that rather than being contingent upon the inclusion of energy saving information or interactive elements, the success of these programs is primarily due to the function of the display in temporarily disrupting normality, thereby making energy use visible. I say 'temporary' because new routines around the display are likely to form, rendering the display invisible – a point we may only hypothesize about in the absence of long-term studies of direct feedback.

Regardless of specifics, total household electricity consumption, in these studies, again, is taken as a proxy for behaviour, and treated as if all activities contributing to the total electricity use were governed by similar attitudes, internal logics and narratives and meanings. In this sense, feedback studies typically remain silent on the ways in which the information provided to households are integrated in household operations. On the other hand, the feedback literature rests on the premise that frequent feedback can make the consumer conscious of what is usually invisible, intangible and habitual energy use, and in that sense acknowledges the less intentional ways in which energy consumption occurs. In short, consumption of the feedback literature is still a homogeneous and monolithic one, but one that, at least implicitly, can occur in habitual ways without the intention to consume.

2.3 The medium and the message

As suggested in the discussion above, most studies of feedback focus on the frequency with which consumption information is communicated, often excluding discussions of how this new information might be understood and integrated in household operations. Other studies, however, focus specifically on some of the other dimensions of how information on energy savings is interpreted, understood and integrated in everyday practices. Some, for example, explore how trust in the source of information affects actions taken by households upon receiving that information. Craig and McCann (1978), for example, mailed two sets of brochures on energy saving, at random, on the stationery of the New York State Public Service Commission or on the stationery of the local electric company, Consolidated (Con) Edison. Both groups had the option of requesting more information via an enclosed postcard and their consumption was monitored. Eighteen percent of those that received their letter from the Public Service Commission requested more information, compared to 10% in the other group. Furthermore, this group saved 7% on their electricity bills compared to the other, while both groups saved energy compared to a control group that received no communication at all. Other

studies, like that of Miller and Ford (1985)² have reported similar findings regarding the role of trust in energy conservation action.

The medium through which efficiency messages are communicated is also the subject of analysis in these studies, with many stressing the importance of vivid accounts in achieving behavioural change (Costanzo, Archer, Aronson, & Pettigrew, 1986; Yates & Aronson, 1983). On the extreme end of 'vivid accounts' studies are those that look at behaviour change as a result of the social diffusion of 'ideal' practices. In the often-quoted study of Aronson and O'Leary (1983), for example, energy and water consumption habits of patrons of shower rooms in the university athletic field were observed. Here, the authors compare three cases: 1) the introduction of a large sign in the middle of the shower room prompting people to turn off the water while soaping up, 2) employing a student to serve as a model by turning off the water and soaping up when the facility was in use and 3) using two models to demonstrate the same desired behaviour. Their results suggest compliance rates of 6%, 49% and 67%, respectively, highlighting the importance of social networks and peer groups in adopting energy efficient behaviours. What makes this study unique, however, is its discussion of consumption not as an abstract, aggregate entity, but rather consumption as an embedded occurrence in one very specific activity.

Making public commitments to partaking in energy saving behaviours has, likewise, been shown to increase the success rate of campaign to change energy practices. Pallak, Cook and Sullivan (1979), for example, provided households with energy saving tips and asked them to participate in the program by making public or private commitments to saving energy. Those in the public commitment group were told their names would be published in an article, and those in the private commitment group were promised anonymity. The study demonstrated that people who made public commitments to engaging in energy saving practices around the use of their heating and air conditioning saved more energy than those who made private commitments and those in the control group, and that the energy savings in the public commitment group continued for over a year after they had been told that their names will not be published after all.

² This study on households that received information on energy audits finds that 31% of those that received the letter on the County's letterhead (as compared to 6% among those that received the letter from the company administering the audits) requested energy audits.

Here, again, it is important to note that with the exception of the Aronson and O’Leary (1983) study, most of the applied research reviewed above attempts to explain changes in consumption rather than explaining changes in specific energy behaviours. Furthermore, it is concerned with the drivers of behavioural change rather than the drivers of particular patterns of consumption/behaviour. Moreover, these applied studies are often criticized for paying less attention to workings of the cognitive processes that may influence environmentally significant behaviour (Kurz, 2002). A different class of studies, on the other hand, tends to investigate the ways in which attitudes (towards the natural environment in general, or towards specific environmentally significant actions) affect behaviour.

2.4 The attitude business

These studies by and large view behaviour as an outcome of a balance between the individual’s attitudes and the influences “situational factors”, such as price, income, access to information, etc (Ajzen, 1991; Ajzen & Fishbein, 1977). These models, which more and more attempt to incorporate situational and contextual variables, still primarily focus on the individual’s attitudinal variables as predictors of environmentally significant behaviour, such as recycling and energy consumption, which, again, is implicitly taken as a proxy for behaviour.

Relying, primarily, on surveys of household beliefs and energy use, these studies have had varying degrees of success in explaining household energy consumption. A study by Becker et al. (1981), for example, not only finds statistically significant relationships between three kinds of attitudinal factors and winter gas consumption, but also manages to explain about 18% of the variation within their sample³, using various measures of attitudinal factors and family finances. The authors find attitudes towards comfort and convenience to be the most important variables in explaining household consumption. Heberlein and colleagues (Heberlein & Warriner, 1983; Linz & Heberlein, 1984) have, likewise, conducted studies that find significant relationships between certain attitudes and energy consumption/behaviour. In a study of how time-of-day pricing affects consumption during on and off peak hours, Heberlein and Warriner (1983), find that establishing a commitment to shifting electricity consumption to off peak hours has a far more significant effect than the magnitude of the on-to-off-hour price ratio. The authors find that variables such as the ascription of responsibility to the individual, awareness of consequences of energy use and a belief in the energy crisis were significant in forming a personal obligation to

³ Seeing that this is the first time I’m brining up the question of how much variance we have typically managed to explain, I’m going to stop and point out that 18% is huge, given the variables accounted for.

shifting time of day energy use. Two years after the introduction of the time of day pricing, Linz and Heberlein (1984) find that these variables which had previously been significant in predicting the formation of a personal obligation to shift time of day energy use had been supplanted by a new variable: the household's self-perception of their shifting behaviour (i.e. how often they thought they had changed their behaviour and how much electricity had been shifted from on-peak to off-peak times). This finding speaks to the observations that often people arrive at their beliefs based on the actions they think they are engaging in, rather than the other way around. Gardner and Stern (1996), also highlight the fact that engaging in more efficient behaviour may inspire individuals to reformulate their attitudes. The directionality of the influence from attitudes to behaviour or from behaviours to attitudes is then, perhaps, best viewed as bidirectional (though when Black et al (1985) test the reverse direction they find that the attitude-behaviour model explains more of the variance in the 'behavioural' dependent variables, where behaviour-attitude models explain more of the variance in 'attitudinal' dependent variables⁴, and therefore proceed with the model that best describes the desired outcome).

As mentioned earlier, though, attitude-behaviour models have had mixed and inconsistent results in studies of household energy use. Stutzman and Green (1982), in their "field-tests" of the Fishbein-Ajzen model find that situational factors (knowledge in the case of a sample of students and income, in the case of a sample of the general public), rather than attitudinal factors, were the most powerful predictors of energy consumption. Brandon and Lewis (1999), in their study of feedback and its effect on energy consumption, also found environmental attitudinal variables to have no statistically significant relationship with historic consumption and only marginal significance after energy conservation interventions took place. This observation raises an important point with regards to distinguishing between studies that attempt to explain changes in consumption as a response to an isolatable, temporally-bound event (often, some aspect of the study itself) and those that attempt to explain consumption over time. Specificity, again, is lacking in making a distinction between changes in consumption in response to conservation programs that attempt to disrupt household habits and form new ones and routine consumption in the absence of such disruption⁵, but also around which specific attitudes may legitimately be linked to consumption. This latter point is one that Heberlein and Warringer (1983) brings up in dispelling the arguments around the inconsistent results of attitude-behaviour

4 This 'chicken and the egg' debate, I must admit, makes me quite dizzy. That it should exist at all signals an uneasiness in viewing 'behaviour' as an outcome of other factors - even on the part of those who subscribe to this kind of thinking. That it should get resolved in any unidirectional way makes me uneasy, especially since an easier resolution (for me) would replace this view of behaviour as an outcome of external factors, with one that sees it and the external factor as co-constitutive - which is akin to seeing the driver (of behaviour) and the driven (behaviour, itself) as parts of the same process (see Shove, 2010).

5 I feel like I'm entirely guilty of this same crime, here. This just didn't occur to me earlier.

models. Instead, the authors argue that such models must link specific attitudes to specific forms of energy consumption, like heating or air conditioning.

Whether (pro-)environmental attitudes and motivations factor into households' energy conservation actions is, however, contested by the qualitative literature that explores this area⁶. Doing in depth interviews with people who have participated in energy conservation programs, Crosbie and Baker (2010) find motivations for participation to be aesthetic considerations and the notion of 'life improvement', rather than environmental attitudes. Gronhoj (2006), in her interviews with 30 households on family decision making and negotiations around sustainable behaviour practices finds that "In some cases, concern for the environment appeared to be part of the reason for these talks, but in general, environmental consequences did not seem to have played a major role" (p. 499). Rather, she finds that the families in her study explained their energy-related decisions in terms of issues such as time, taste, convenience, health, and finances.

Black et al (1985), distinguishing between different classes of energy conservation action, find the effect of personal (attitudinal) variables decline as required effort or cost of the particular action increased⁷. Stressing this point, Stern (2000) argues that "Studies that examine only attitudinal factors are likely to find effects only inconsistently, because the effects are contingent on capabilities and context" (p. 418). Taking account of these kinds of variables, Guagnano et al. (1995) propose an 'A-B-C' model of behaviour (the letters standing for Attitude, Behaviour and Context), which shifts the focus of attitude-behaviour studies to beyond the individual and towards more integrated models of understanding energy behaviour. Though, as I will argue in what follows, these 'models' and understandings of behaviour (and consumption) still remain very much espoused to an idea of behaviour that is driven by factors external to it, and can be seen as an outcome or expression of these factors.

2.5 Lifestyle and stuff

Perhaps in an attempt to broaden the range of factors taken into account in understanding energy use, a subset of the energy behaviour literature began exploring these contextual variables by looking at 'lifestyles' and how they might have implications for energy consumption.

⁶ Or more appropriately whether pro-environmental attitudes and motivations feature in household narratives of energy conservation

⁷ From 59% of the explainable variance in self-reported home thermostat settings to 50% for minor curtailments such as shutting off heat in unused rooms, 44% for low-cost energy efficiency improvements such as caulking and weather-stripping, and 25% for major investments such as adding insulation or storm windows.

However, here, again, the term 'lifestyle' seems to have been operationalized differently in the literature. In a review of lifestyle approaches to understanding energy consumption, Jensen (2008) identifies two broad conceptualizations of lifestyle prominent in the literature. The two broad notions of lifestyle underlying the specific treatments of the concept, Jensen argues, are understandings of lifestyle as 1) something akin to 'class' and 2) a replacement for the concept of 'class' that allows an element of individual choice in worldviews and consumption patterns beyond that found in the more structural understandings of class. Hallin (1994) differentiates the approaches similarly, with one class of lifestyle works interpreting lifestyle as a structural phenomena and the other focusing on the analysis of tastes and patterns of consumption.

Jensen explains the second group of lifestyle concepts as following in the tradition of scholars like Giddens, Beck and Baumann, where individuals of the modern and late-modern era have to actively make choices and act reflexively in light of the dissolution of the certainties, structures and norms of former times, thereby defining their own patterns of consumption and particular lifestyles. Out of this conception of lifestyle, Jensen argues, comes the literature on green and environmentally friendly consumption (Alcott, 2008; Jackson, 2008; Seyfang, 2005). Jensen's own work, however, points to limitations of understanding household energy consumption in such limited terms as "green" (or not), highlighting the many ways in which environmentally friendly (for lack of a better term) actions and consumption happen outside of green lifestyles and with associated narratives other than those around some form of green consciousness (Jensen, 2008).

The first class of lifestyle concepts in Jensen's classification, on the other hand, is related to the works of Pierre Bourdieu and Mary Douglas, which yield a view of lifestyle as essentially a "structural phenomena" (Jensen, 2008, p. 354). Given the breadth of the theoretical range, however, it's not surprising that lifestyle concepts of this kind have been operationalized in diverse ways, ranging from analyses of socio-demographic factors to cross-cultural explorations of habits and social norms. It should be mentioned that the ascription of various studies of household energy use to this conceptualization of lifestyle is somewhat of a post hoc move, and that a critique of the use of the term 'lifestyle' in household energy studies has, in fact, centred on the imprecise use of the term (Wilhite et al., 2003) and the lack of engagement with any consistent body of theory. As I review the literature in this section, rather than relying on the lifestyle terminology, I will try to focus on how specific understandings of lifestyle have been linked to energy use.

When Dillman et al. (1983) speak of lifestyle and energy consumption, for example, they specifically mean lifestyle as distinguished by income. Their study of how households respond to increasing costs of energy services finds that low-income households tend to accept lifestyle cutbacks (reduce their expenditure on recreation, vacations, etc) where those in higher income brackets tend to invest in energy efficiency⁸. Other socio-demographic indicators are also frequently explored in these lifestyle studies, though the results are often at such level of aggregation that they rarely shed light on specific ways in which households engage in energy consuming activities. Druckman and Jackson (2008), for example, report energy consumption and associated carbon dioxide emissions for 7 lifestyles “supergroups” in the UK⁹, but beyond use in modeling and energy demand projection exercises, or highlighting differences in aggregate consumption among different groups, these results say very little about the specific household activities that form the basis of energy use.

Another common theme in studies of household energy use is the investigations of the role of ethnicity in energy consumption. Distinct variations in both household energy consumption and energy consuming practices along ethnicity lines have, in fact, been reported in the literature (Hackett & Lutzenhiser, 1991; Maller, 2011). Hackett and Lutzenhiser’s (1991) study of university apartment complexes primarily inhabited by international graduate students, for example, finds that energy consumption can indeed be linked to households’ ethnic origin, when controlling for variation in factors such as economic, climate, and housing structural variables. A curious finding of this study, however, was that once the billing arrangement in these complexes was changed from master metering to individual unit billing, variations between groups from different parts of the world virtually collapsed. The authors argue that while cross-cultural variations in energy use exist pre-conversion, the conversion in billing methods here seems to have achieved a certain degree of “neutralization” of the cultural dimension of energy use, and instead made prominent the inhabitants role as customers or consumers (as a relationship defined with respect to the utility company) (Hackett & Lutzenhiser, 1991, p. 464).

Maller’s (2011) qualitative study of energy practices in immigrant households in Australia also highlights the ways in which these households adopted new energy habits after immigration as well as how older habits and understandings of resource use persist. This study locates energy use as embedded within material and infrastructural realities of the lives of these households in

⁸ Though, I have serious qualms about their methodology.

⁹ These being: Blue Collar Communities, City Living, Country Side, Prospering Suburbs, Constrained by Circumstances, Typical Traits, and Multicultural.

their new country, as well as social and normative processes at play in both Australia and their countries of origin. Both studies, in essence, highlight what has been termed the 'obligatory' nature of energy consumption, as something embedded in the social identities, as well as material, infrastructural and cultural dimensions of every day life (Hackett & Lutzenhiser, 1991): "The newcomer encounters a material culture and the instructions and rationales for deploying it already in place", write Hackett and Lutzenhiser (1991), and "adapt to what is in essence a given pattern of consumption, so that their resource "demands" are not appropriately thought of as a priori, but rather as emergent" (emphasis in the original, p. 467).

The social and cultural dimensions of energy use are further elaborated on in cross-cultural studies, such as Wilhite and colleague's work on energy use in Japanese and Norwegian homes (1996) or Erickson's work in Minnesota and Sweden (Erickson, 1987). In comparing energy use practices, the first study highlights the cultural significance of what the authors identify as energy-intensive practices in Norway and in Japan. Exploring the ways in which Norwegians view and talk about their heating and lighting practices, the authors argue that space heating and the use of multiple diffused sources of "warm" light have important symbolic and cultural functions in creating "what the Norwegians call *koslighet* (coziness), a state of comfort which is virtually mandatory for Norwegian living rooms." (Wilhite et al., 1996, p. 798). The Japanese households, in contrast, prefer fluorescent lights, which they describe as "bright" (something, which, according to the household they interviewed, incandescent light bulbs are not). The authors, here, argue for understanding coziness as a "cultural energy service".

Erickson's work, similarly, reveals energy use narratives in Minnesota and Sweden that are completely embedded in cultural narratives around ways of life. The Americans in her study, for example, explained their energy intensive activities by stressing how they were all done in an attempt to save time, offset the stresses of daily life or assert independence and identity in response to the global forces, energy crises and consequent calls for energy conservation that left them feeling powerless. Where the Americans in her study were apologetic about their energy intensive practices, the Swedes viewed their ways of life as "good" and "beautiful" and saw no reason to change their habits, even explaining their saving habits in those terms (for example, they rode bikes because it was "beautiful" to exercise). Both groups, however, stressed the importance of conducting their energy using activities in socially appropriate ways (i.e. heating the home more than usual or having the oven on to keep meals warm, when expecting guests, etc). In this sense, Erickson highlights the importance of social norms in

explaining energy use by noting that in both places engaging in energy intensive practices for reasons of saving time or meeting cultural standards of housekeeping and entertaining was not questioned.

In proposing a cultural model of household energy consumption, Lutzenhiser (1992) had precisely this more integrated¹⁰ and holistic treatment of energy use in mind. Seeing material culture as made up of socially-regulated and culturally meaningful items, he calls for a cultural analysis of the similarities and difference in energy use among various energy sub-groups, in terms of “similarities and differences in dwellings, vehicles, appliances, everyday routines, status understandings, technological knowledge, patterns and behaviour, and belief” (Lutzenhiser, 1992, p. 56). An investigation of “energy cultures” (Stephenson et al., 2010) and sub-cultures, it is argued, will shed light on the internal logics of each group around the use of energy and technology.

Many of the studies cited in this section, in fact, explore various facets of these internal logics among energy subculture (as identified by income, ethnicity, and nationality, in these examples). Other studies, still, identify alternative energy cultures within these. Aune’s (2007) work, for example, characterizes energy cultures in Norway centred around three conceptions of the home: “home as haven”, “home as project” and “home as arena for activities”, suggesting (but not empirically demonstrating to my satisfaction) that these subgroups have different patterns of energy use. Dowling and Power (2011), though not specifically focusing on energy use, also suggest a rethinking of household sustainability in terms of notions of ‘homeyness’. Hallin, likewise, discusses energy use and adaptation in terms of ways of seeing the home (1994). Carlsson-Kanyama et al (2005), on the other hand, explore differences in energy using activities among different generations of Swedes, demonstrating consistent energy use practices and attitudes among households of the same generation, with younger households, for example, engaging in more energy intensive laundry practices, preferring higher indoor temperatures, but airing their houses less than older ones during wintertime.

Clearly, many other kinds of “energy cultures” exist and while one might worry about deterministic frameworks emerging as a result of the arbitrary grouping of households based on their patterns of energy use, I would suggest that this approach to understanding household

¹⁰ Lutzenhiser’s is certainly not the only integrated model of energy use. Van Raaij and Verhallen (1983) propose an integrated behavioural model of energy use. Dholakia’s (1983) model emphasizes the importance of socio-political factors. Hitchcock (1993) proposes an engineering “systems approach” to understanding energy use. Most, however, have had limited take up in the energy use literature (for a review, please see Keirstead, 2006)

energy use disengages from equating behaviour and consumption by exploring the way in which energy-consuming practices are conducted within households. In this way, it begins to shift the focus of investigation from one that views consumption/behaviour as an outcome of various social or individual contextual variables and towards one that explores how households engage in activities that use energy.

3. WHAT'S WRONG WITH TALKING ABOUT CONSUMPTION?

So far, in this paper, I have reviewed the literature on household energy use, highlighting the emphasis on explaining energy consumption in terms psychological, demographic, cultural, and economic variables. Much of the literature on household energy behaviour –and, again, I use that term broadly, to mean something akin to 'energy consuming actions'- seems to view consumption as either a proxy for behaviour or an outcome of other factors, often casually referred to as context or lifestyle, and therefore expressive of them. In other words, much of this literature views consumption as expressive of intention (especially when couched in the language of choices and decisions) or structure. My critique of this literature is centred on the question of whether or not energy consumption is an appropriate lens for investigating the ways in which households engage in energy consuming activities or behaviour¹¹. In what follows I will argue that it is not a useful (and successful) way of exploring behaviour – especially, when behaviour itself is conceptualized not as an outcome of psychological or socio-normative processes. I will suggest that if energy consumption is to be taken as a proxy for behaviour it must first be demonstrated that it can, in fact, index behaviour, rather than simply assumed to be capable of doing so. I will also suggest that not only does the literature on household energy use fail in doing this, but it also remains devoted to explaining energy consumption (this being energy demand and measured in kWhrs or GJ, or their dollar equivalents) as a monolithic, outcome variable rather than one that is composed of many distinct processes of consumptions tied to different household activities, each of which fulfills different functions and is governed by different internal logics, among which 'expression' may or may not feature prominently. This view of consumption, of course, is not limited to the quantitative studies that attempt to explain the variance in household energy consumption, but is also prevalent (though, perhaps, less explicitly so) in qualitative studies that query social norms or motivations for energy efficiency investment to a lesser extent. In other words, much of the literature on energy behaviour reviewed so far seems to, at its worse, take consumption as a proxy for behaviour (for example in psychological studies that link environmental attitudes or trust in the source of information to

¹¹ of course one could just as easily question the way behaviour is conceptualized in the literature as something that can be approximated through the concept of consumption.

'behaviour') and at its best as an outcome of specific behaviours, actions, or contexts. More importantly, it takes up consumption without questioning its 'usefulness' in understanding households' energy consuming activities.

Other forms of consumption (like that of cultural material, food, recreation, etc) have been empirically shown to be signifiers of certain lifestyles. Sobel (1981), for example, argues that consumption in post WWII America, is such integral part of the culture and the individual psyche that it can be taken as an expressive behaviour which indexes lifestyle better than other plausible alternatives, such as work and leisure. Though the specifics of Sobel's argument have no relevance here (nor do I agree with them all), I want to highlight some of his empirical analysis. In exploring variations in 17 categories of household consumption (neither of which include energy consumption), he explains 60-90% of the variance in expenditures based on a simple ordinary linear regression model including basic socio-demographic variables, demonstrating that consumption can be taken as an expression of lifestyle operationalized as socio-demographic variables. To take energy consumption as a proxy for lifestyle, as some studies of energy behaviour seem to do, or to take it as an expression of specific lifestyles or behaviours would require first empirically demonstrating that it can, indeed, be taken as such, perhaps in a manner similar to Sobel's analysis.

I would argue that not only has this expressive power of consumption been taken for granted without empirical demonstration, but also that the empirical evidence suggests that it, in fact, is a poor expression of behaviour and/or lifestyle. This point can be illustrated more easily by looking at quantitative studies of household energy use: Studies of household energy behaviour have repeatedly shown that we can, at best, explain between 30 and 50% of the variation in energy expenditure and consumption (Morrison, 1987). Though significant variations in climatic, regulatory, and infrastructural variables accounted for in these studies, as well as differences in approaches and duration of consumption measurements make a direct comparison of the explanatory power of these models difficult, I think it useful to briefly review some of their findings. Models that succeed in explaining the largest amount of variation, like that of Cramer et al (1985), rely on measurements of more specific and short term forms of consumption – in this case, summer electricity usage which is primarily driven by air conditioning use, in their location of study. Cramer's model explains 58% of variation in summer electricity usage, with 51% of the variation explained when only engineering variables (i.e. housing type, appliance index, etc) were used and 33% of the variation explained when only non-engineering variables

such as socio-demographic, thermal comfort, environmental and conservation attitudes, and knowledge variables were included.

However, explaining variation in total energy consumption when both electricity and heating consumption is considered over a longer timeframe often has met with less success. Fagerson's (1987) investigation of variations in total energy consumption based on engineering variables and basic socio-demographic variables, as well as thermostat settings and housing occupation rates explains 32% of the variation in energy use. My own model of the energy expenditures based on data available from the 2009 survey of household spending from Statistics Canada explains 31% of the variation when only demographic information is included in the ordinary linear regression model, and 43% when geographic, market regulation and engineering variables are included. Hirst et al (1982), however, account for 57% of the variation in total energy use in their analysis of the data from EIA's National Interim Energy Consumption Survey (NIECS) for the period between April 1978 and March 1979 (though they exclude all data points for which floor area is not known – a variable that many models don't have access to)¹². These studies, nonetheless, point to a key element in understanding why energy consumption might not be a useful lens through which household energy consuming activities are studied – namely that there is no singular form of energy consumption; rather, it occurs as part of many different household activities, in the sense that the ways in which households use lighting might be understood differently than the way in which hot tubs are used. This distinction is hinted upon when electricity and natural gas use are studied separately in the studies discussed above or when Jensen (2008) finds no clear link between consumption of heating, electricity (and water) among households in his study.

This discussion of energy consumption highlights several important considerations: Firstly, it suggests that energy consumption (as an outcome variable measured in energy units or dollar amounts) might not be a suitable stand-in for either behaviour or lifestyle. An unquestioned equating of behaviour with consumption, as was common in the early studies of energy use, might therefore not add much insight to understanding household energy use. Furthermore,

¹² I am offering no direct comparison of these studies since, as mentioned already, such comparisons are difficult because of the variations in consumption measurement, statistical treatment of data (some use logarithmic function of their continuous variables while others don't, some exclude certain data points, while others don't), and the reporting of the measure of explanatory power (R² vs. adjusted R², etc). However, what can be said about these studies is that 1) No more than 60% of the variation in energy consumption is ever explained using a combination of engineering, demographic, regulatory, and attitudinal variables. 2) Housing structural variables (or engineering variables) have the most explanatory power in all studies of household energy use, with other variables (demographics and attitudes, typically) adding at most a 10% additional explanation of variance. On their own, demographic-type variable explain about 30% of the variation and attitudinal variables are shown to explain about 10% of the variation in attitude-behaviour studies.

though the original aim of studies of household energy use might have been to explain energy demand by investigating its social context, many of these studies have been so devoted to this consumption/demand agenda and so unquestioningly so, that their narrow focus might have precluded the study of the context they set out to understand. Wilk and Wilhite (1984), in fact, argued that many of household energy use studies are hampered by methodologies that “studies the outcomes of decisions rather than the process of decision making, an endeavour which resembles reconstructing chess strategies by looking at the outcomes of games.” (p. 453) Simply put, the study of consumption in the aggregate, as an entity separate from the practices within which it is incurred has limited the possibility of exploring the very social context that social scientists were charged with explaining.

I have argued that viewing consumption as a proxy for behaviour or as an expressive behaviour in itself precludes the study of the more inconspicuous forms of consumption, the household routines and practices within which it is incurred and the material realities through which it is mediated. Others critique energy behaviour studies, on different grounds: Highlighting the genesis of this branch of research in psychology, and pointing out the unit of analysis dictated by this view (the individual) as a limitation of these approaches, Wilhite and colleagues (2003) advocate a more socially-grounded understanding of consumption, incorporating notions of need and comfort and proper conduct:

At first sight, the challenge of understanding behaviour might not seem to be so different from that of understanding demand. In the world of energy policy, the behaviour which is of interest, and which has been the focus of attention, is that which is associated with energy consumption and hence with demand for energy resources. In terms of social theory these two concepts are, however, a world apart. As we have shown, theories of behaviour have an ancestry grounded in psychology and the study of individual belief and action. By contrast, the concept of demand points to the development of markets, the social and technical construction of needs, and the steady evolution of expectations about what constitutes a ‘normal’ way of life (p. 117).

I would argue that the two, the focus on aggregate consumption (as if it were a definitive point in time) and the individual consumer go hand in hand, being joined through the assumption that energy consumption is expressive – often of agency and intention, necessitating an agent, which is often taken to be the individual. Critiques of this focus on the individual as the unit of analysis have been fairly prevalent on several accounts, including its conceptions of the individual actor:

While, assumptions about a 'rational' individual actor implied in earlier economics models of energy use have been replaced by concepts of 'bounded rationality' or 'intended rationality', even this conception of the intentional actor has proven problematic in studies of household energy use. The conception of the individual that acts with intention, as is implied in the language of 'decision making', still neglects the role of habit and incidental and inconspicuous energy use¹³. The focus on the individual in studies of household energy has also been extensively criticized on the basis of its exclusion of family negotiation processes, household dynamics, institutional arrangements and cultural norms (Carlsson-Kanyama & Lindén, 2007; Gladhart & Roosa, 1982; Grønhøj, 2006; Hinchliffe, 1996; Judkins & Presser, 2008; Lutzenhiser, 1993). Critiques of the political implications of the focus on individual in both energy studies and energy policy have, however, been less common. Though, analyzing the energy efficiency discourse, Gyberg and Palm (2009) identify 'individual choice' as a strong theme, one that they link to the use of information as part of the movement towards deregulation and privatization of service provision and neoliberal approaches to governance. "The battle for the future energy systems", they argue, "is in this sense made a consumer-oriented issue and it is the consumer who is expected to make the defining decisions leading to sustainability" (p. 2810). The consumer (whether it is conceptualized as an individual or a household, or an organization, for that matter) is, then, responsible through the act of consumption, something that much of the literature on the subject conceptualizes as intentional as well as symbolic and expressive.

Though, other forms of consumption seem to fulfill this expressive criteria, as I have already argued, empirical studies of household energy use suggest that energy consumption does not. Here, I want to suggest a few reasons why this might be the case. Firstly, energy, by virtue of providing an essential service for households, functions differently than other commodities or goods. Furthermore, consumptions of other commodities – whether consumption is defined as the moment of purchase or use – can often be traced to a single, often intentional moment. Energy use, on the other hand, is firstly, embedded within ongoing habits, routines and rituals – such as washing of dishes and opening of windows – that may not be seen as moments of energy consumption by those who partake in them. Secondly, energy use, even when intentional, is mediated by processes, technologies and material that by virtue of their thermal efficiencies or insulation properties affect the amount of energy consumed in achieving any given level of service. But most importantly, as I have suggested already, energy consumption

¹³ It is important to note, though, that the intentionality problem is not limited to studies that focus on the individual actor, but also those that consider the entire household.

in the aggregate household level, represents different forms of consumption tied to various activities, each of which may be understood in different terms, governed by different logics and (if we insist on staying tied to some notion of expression) express different things. Focusing on the act of consumption or the individual consumer, therefore, treats both as homogenous and yields a limited understanding of energy use in households. Next, I will discuss a more recent approach to studies of household energy use that attempt to bypass both sets of challenges by focusing on practices within which energy consumption is embedded rather than individual actors or significant moments of consumption.

4. ENERGY USE AND THEORIES OF PRACTICE¹⁴

In an attempt to bridge the dualities and dichotomies of habit and intention, action and structure, and individual and social and following the practice turn (Reckwitz, 2002; Schatzki, Knorr-Cetina, & Savigny, 2001) in social theory, studies of household energy use are more and more drawing on theories of practice in their investigations of energy consuming activities, or practices. Practice theory, as a form of social theory, stands opposed to both purpose-oriented (rational choice) and norm-oriented theories of action (Reckwitz, 2002), by focusing on practices as mediating concepts between individual choice and social norms and structures. Practice theory has a rather diverse theoretical origin, but Bourdieu's work and Giddens' 'theory of structuration', and more recently Theodore Schatzki's work are seminal in charting a path and developing a social philosophy focused on the concept of practice.

Distinguishing between practice as a coordinated entity and practice as a performance, Schatzki (1996), defines the first as a "temporally unfolding and spatially dispersed nexus of doings and sayings." These doings and sayings are linked in several ways: through understandings (of what to say and do, for example), through explicit rules of engagement, and through what Schatzki refers to as "teleoaffective" structures embracing ends, projects, tasks, purposes, beliefs, emotions and moods." (pg. 89) Practice as a performance, in contrast, is a specific enactment of practice as a coordinated entity. Alternatively, Reckwitz (2002) defines practice as a

routinized type of behaviour which consists of several elements, interconnected to one other:
forms of bodily activities, forms of mental activities, 'things' and their use, a background

¹⁴ I am about to say absolutely nothing new here, merely reassembling arguments from Warde (2005), Røpke (2009) and Shove (2010).

knowledge in the form of understanding, know-how, states of emotion and motivational knowledge (p. 249)

Both definitions highlight elements of temporality (routinized, temporally-unfolding), action (bodily activities, doings), and understandings and competence (understandings of what to say and do, rules, know-how, background knowledge). Reckwitz' definition emphasizes the role of material and artefacts (things and their use), a view that is also reflected in Schatzki's later work, where practices are seen as composed of "embodied, materially mediated arrays, and shared meanings" (Schatzki et al., 2001, p. 3). Drawing on these two definitions, Shove and Pantzar (2005) see practices as the "active integration of materials, meanings and forms of competence," created and recreated by practitioners as well as the producers of the materials and technologies that are involved in these practices. In this sense, energy-consuming practices – encompassing the varied and routinized performances, practitioners enacting these performances, energy generation infrastructure and energy-consuming technologies – are the primary objects of study. In other words, practices become the site of the social and the basic ontological units for analysis (Schatzki, 2002).

Extending this particular view of practice as the basic ontological unit of analysis to discussions of consumption, Alan Warde (2005) argues that consumption (but not shopping, which is a practice in itself) occurs as a consequence of engagement in practices, and must be understood as a "moment in almost every practice" while not being an integrated practice in itself. The argument is similar to those made above with regards to inconspicuous, unintentional and habitual energy consumption, emphasizing the observation that people partaking in activities that consume energy, rarely see themselves in the act of consumption, but rather cooking, driving or heating their homes:

From the point of view of a theory of practice, consumption occurs within and for the sake of practices. Items consumed are put to use in the course of engaging in particular practices like motoring and being a competent practitioner requires appropriate consumption of goods and services. (p. 145)

I would argue that this view of consumption is particularly suited to understanding the consumption of services like the ones that energy provides, allowing for the opportunity to focus on disaggregating household consumption to its constituents. The source of 'behaviour' change,

if we are to adopt this view of energy use, then, lies in the particular trajectories in which practices develop.

Another implication of this view of consumption, however, is that 'wants' and 'needs' are created by practices, rather than individual desires, be it utilitarian or expressive. Warde, again, argues: "it is the fact of engagement in the practice, rather than any personal decision about a course of conduct, that explains the nature and process of consumption" (p. 138). When Hackett and Lutzenhiser talk about 'the obligatory nature of energy use' in the study mentioned earlier, they speak of the demand and 'wants' as something embedded and pre-existing in cultural norms (though they are certainly not using the language of practices), their observation is not unlike that of Warde's. In fact, several other studies of household energy use also speak of demands or energy wants, not as born of specific desires but as something existing a priori in materials with which people interact or cultures that they inhabit: Wilhite (2008), for example, argues that household appliances bear agency and the potential for certain practices and in fact, script energy-using practices in sometimes, unintended ways. Pierce et al (2010), likewise, investigate domestic interactions between people and their energy consuming technologies and comment on the extent to which energy demand is embedded in habits of individuals and the ways in which technology interfaces such as the 'normal setting' on washing machines determine energy use.

What role does individual agency/desire, then, play in differential engagement in practices? Theories of practice view the individual, not just as an agent or a carrier of practices, but rather in his/her engagement in varying social practices, the individual becomes "the unique crossing point of practices, of bodily-mental routines" (Reckwitz, 2002, p. 256). Røpke (2009) comments on the "strong element of path dependency in daily life", arguing that engagement in different practices throughout one's life alters the mind and the body of the individual, preparing them for participating in some practices while excluding others (p. 2493). The individual, here, enacts his/her agency and intention in developing the skills and capabilities required for engagement in particular practices. More importantly, though, theories of practice offer a distinctive perspective, attending less to individual choices and more to the collective development of modes of appropriate conduct in everyday life. The analytic focus shifts from the insatiable wants of the human animal to the instituted conventions of collective culture, from personal expression to social competence, from mildly constrained choice to disciplined participation (Warde, 2005, p. 146). By shifting the analytical gaze to the social development of modes of appropriate conduct,

a practice theory approach to studying energy use allows capturing generational changes in habits and routines, notions of thermal comfort, and expectations around appropriate behaviour, such as levels of cleanliness and convenience.

While several of the household energy studies reviewed earlier attend to these factors (Carlsson-Kanyama et al., 2005; Erickson, 1987; Wilhite et al., 1996, for example) Elizabeth Shove's (2003) *Comfort, Cleanliness, and Convenience* specifically engages with documenting the co-evolution of these notions and everyday household practices such as heating and bathing. Arguing that "when statistical normality is taken to represent normality in the 'real world' the range of practices and conditions that might be so described is inevitably narrowed" (p.33), Shove demonstrates the processes by which certain forms of consumption, such as daily showers, are naturalized and the indoor environment standardized, for example, in terms of acceptable variations in indoor temperature. Complementing studies that trace these trajectories of development for different practices, are studies that investigate the varied ways in which energy-consuming practices are enacted in households and the roles they fulfill. Rather than presenting a homogeneous and stable view of household practices, for example, Hand and Shove (2007) highlight the ways in which ordinary household appliances such as freezers, and associated household practices like freezing, fulfill an elastic role in many different household regimes, from those who go to extreme lengths to consume locally grown foods to those that use freezers primarily as means of creating convenience around food preparation.

Practice-focused studies of household energy use, then, allow for more integrated understandings of the ways in which energy consumption occurs, by diverting the focus from resource consumption to the services that resource consumption makes possible, as well as the ways in which individuals, as competent social practitioners, integrate materials and understandings of appropriate conduct to partake in practices that have socially significant meanings. This shift in focus, in effect, will address critiques of the earlier literature on grounds of their treatment of consumption as a homogenous, monolithic variable and the individual as the unit of analysis.

5. CONCLUSIONS

This paper, in essence, problematizes the conception of the individual actor/consumer and the act of consumption in the studies of household energy use. I have argued that the literature on

energy behaviour has primarily focused on the individual as the unit of analysis and consumption as the variable of interest in ways that have not been conducive to understanding the ways in which households engage in energy-consuming actions and practices. Consumption in much of this literature is conceptualized as if occurring in a decisive moment by a consumer that not only is aware of the fact that he or she is participating in the act of consumption, but should also be held responsible for explaining this act, whether through attitudes he or she might show towards certain issues or by his or her desires to express. More importantly, consumption is usually conceptualized as if the different practices which contribute to the total household consumption could be treated similarly and in the aggregate.

In the 90's, scholars of energy use began criticizing the focus on the individual as the unit of analysis, suggesting the inclusion of variables such as household negotiation processes and understandings of institutional arrangements as a way forward in studies of household energy use. The focus on consumption, however, has often been taken for granted to the extent that 'behaviour' has often been equated with consumption, often treated as a monolithic variable. Theories of practice, on the other hand, get around both problems by offering an integrated perspective on energy consuming actions and behaviour (or practices) as the prime focus of analysis. In this view, consumption is not seen as a practice in itself – nor is it seen as the outcome of other practices. It is rather seen as a process embedded in practices which integrate various understandings of how to behave and engage with the social world, as well as materials in the form of energy consuming technologies or generation and distribution infrastructure, and the skills required to engage with them.

A practice-oriented approach to understanding household energy use sees it in the disaggregated form of the activities that compose consumption, takes into account inconspicuous consumption by getting away from the language of decision making and allows the asking of different questions: rather than how attitudes or lifestyles might influence total consumption, studies of energy use with the practice theory approach investigate the ways in which practices (such as heating, cooking, and freezing) change, and the social processes that govern them. Energy use in these studies is seen as significant only in the sense that it provides services like heating and lighting, but also cultural services like comfort and convenience and allows for participating in practices that constitute the social world. Studying household energy use within a practice-theory framework, in a sense, demands obtaining a finer resolution on activities and practices and a move away from the abstract and aggregate notions of

consumption and towards the concrete and specific ways in which its various components are incurred.

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