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Towards Sustainable Consumption: Reflections on the Concepts of Social Loading, Excess and Idle Capacity

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Introduction: Social Loading and Sustainable Consumption

Sustainable consumption is likely to become ever more central as both a political and a sociological issue. The nature of the problem is well outlined by Hal Wilhite (2016) in *The Political Economy of Low Carbon Transformation: Breaking the Habits of Capitalism*, where he points to the consumption habits of advanced societies and demonstrates the increasing amounts of energy required to serve automobiles, houses, house fittings and kitchen equipment. He sees these as a consequence of capitalism's dependence on growth—he is more explicit on this point than most critics. He proceeds to look for counter-measures which he locates not in individual action but state regulation and effective social mobilisation to

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promote the introduction of alternative ways to conduct everyday life in a world threatened by climate change. We can only concur with the conclusion that radical transformation in consumption patterns is imperative and agree that the solution is not likely to be found by individuals reflecting on their own behaviour and resolving to behave better or more ethically in the future. However, in the light of our suspicion that the replacement of capitalism by an economic system driven by radically different principles is not imminent, we turn for inspiration to a more limited and prosaic matter, identified in a much earlier article, written with Wilhite and Lutzenhiser (1999), which was concerned with fluctuating demand for energy. This article, 'Social Loading and Sustainable Consumption', considered the role of base and peak loads required of suppliers and showed how this inexorably tended towards escalation in demand, and thus higher levels of material consumption than the planet might sustain. In the course of this analysis they employed the term 'just-in-case' (JiC) to explain some tendencies to escalating demand. We explore further the potential of that concept, both as justification for already existing consumption and as an avenue for inventing strategies to make consumption more sustainable.

The aim of Wilhite and Lutzenhiser's (1999) article was to open up inter-disciplinary dialogues to recognise the social processes that underpin ever-increasing levels of energy use and demonstrate their interaction with the infrastructures that provision energy consumption. They did so in the context of a strong critique of energy policy and its reliance on energy-demand models derived from aggregated patterns of use. Energy-demand models focus on aggregate use because the much broader concept of energy consumption is regarded as 'too diffuse and idiosyncratic to be addressed in planning' (ibid.: 281). Consumption, they rightly pointed out, is not simply about use but also the shared meanings, expectations, norms of acceptable or appropriate conduct and, critically, the services that any good can provide in delivering the satisfactory performance of any social activity. Today, this perspective is reflected in the widely accepted understanding of consumption as a 'moment in almost every practice' and that it is the performance of practices that 'generates wants, rather than vice versa' (Warde, 2005: 137). If complex societal challenges such as the environmental impacts of escalating energy

consumption are to be met, simple understandings of use, rather than the practices through which consumption takes place, will just not do. And, for Wilhite and Lutzenhiser, social scientists faced a significant task in ensuring that the more subtle, nuanced, context-specific understandings of consumption are applied to inform energy policy. Many would argue both that accounts of aggregated demand continue to prevail (e.g. Rinkinen et al., 2020), and that the social sciences have yet to meet the challenge of bringing consumption as moments within practices to the front and centre of debate (e.g. Welch & Southerton, 2019).

Social loading is defined as the 'levels of household consumption of energy and other materials' (Wilhite & Lutzenhiser, 1999: 281) that accumulate to form the base and peak loads of human activity. Deliberately re-purposing the language of energy-modellers, who use base and peak to describe the variable levels of demand placed on energy infrastructures, they use the term base load to capture ordinary and everyday human activities that are repetitively reproduced with a predictable frequency. In energy-demand models, peak loads reflect the spikes in energy use that result from collectively timed social events such as peaks of energy use during advert breaks in popular TV shows and rush hours. Energy infrastructures are built to cope with peaks, even though for much of the time they need only cater for base loads. Contemporary energy-demand debates tend to consider this a problem of how to 'flatten' out peak moments of energy use; with social scientists clarifying that peak energy loads represent the collective temporal rhythms of social practices (Walker, 2014) that are fundamental to the social organisation of everyday lives (Southerton, 2020).

The more important point for Wilhite and Lutzenhiser is that the idea of peak load underpins imaginations and anticipations of future needs. Infrastructures build in future capacity, whether for the use of energy, of computing, travel, housing, office space and so on. This 'building in' is premised on two principles, both of which are captured by the term 'just-in-case' (JiC). The first principle is resilience, in which systems and infrastructures build in capacity to cope with spikes in demand and unexpected disruptions (blockages, breakdown, shortage of supply in one part of the infrastructure). The second is provision of infrastructural capacity to cater for future expansion of demand. As an aside, it is worth noting the

current social scientific interest in ‘futures’, which considers questions of how futures are imagined, by whom and in what ways do claims of the future shape action in the present (Jasanoff & Kim, 2015; Konrad et al., 2017; Tutton, 2017; Welch et al., 2020). Wilhite and Lutzenhiser do not frame their interest in JiC as ‘futures’, but their ideas certainly hold synergies with this emergent field of social scientific enquiry.

Their key argument is that energy infrastructures are built for peaks and therefore embed over-capacity in energy systems to accommodate them. Idle capacity is created to deal with exceptional, ‘just-in-case’ conditions. However, they note that today’s peak loads become the base loads of tomorrow. They provide numerous examples of this process in the field of household consumption. The ‘over-sized’ US-style refrigerator, once a device for extraordinary moments of domestic consumption (required only seldom for very large families), has become the norm. The lighting arrangements in Norwegian homes, air conditioning in Japanese homes, the rise of the two-car household in the USA and the re-purposing of bedrooms for office space, all illustrate how excess capacity is provisioned JiC of exceptional peaks, only to quickly become the base line for consumption.

The urgency of the problem upon which Wilhite and Lutzenhiser were focused has only grown since. The resource-intensity of the moments of consumption embedded in everyday practices has continued to rise despite concerted efforts towards more efficient, less polluting goods and services. Relative decoupling, where the environmental impact of each unit of consumption is reduced, has been achieved to some extent. But the problem remains the rising number of units of consumption: increasing volumes of consumption outstrip the efficiency gains per unit of consumption (Jackson, 2009; Hennicke & Hauptstock, 2015).

We think it worth exploring JiC justifications for peak loads and escalating total volumes of material consumption. Often, debate is framed in terms of ‘excess’ and ‘scarcity’: of those who consume too much or too little. As we discuss in the next section, such terms are important because they reveal inequalities and raise questions of social justice. However, they are also limiting with respect to conceptualisation of social loading problems because they imply that a homogenous middle ground between too much and too little—just enough—can be identified (i.e. some need

to consume less, others more; which is self-evidently true but helps little in shifting patterns of consumption). Section “Just-in-Case” considers the social determinants of JiC justifications. Section “Four Options for the Re-configuring the Provision of JiC Modes of Material Accumulation” outlines a set of four related options for re-framing JiC justifications for peak social loading with a view to reducing total volumes of material consumption. These are: (a) articulate rules of thumb for what constitutes an acceptable volume of personal possessions; (b) redefine those rules of thumbs for the performance of context-relevant bundles of practices; (c) harness opportunities for collaborative consumption and engagement in multiple modes of provision; and (d) utilise digital data and applications at the individual and household level to coordinate provisioning for peak social loads while minimising levels of material consumption. We argue that after two decades it is necessary for environmental reasons to take seriously Wilhite and Lutzenhiser’s challenge to disrupt the cycle of escalating consumption.

Problems of Excess and Scarcity?

Discussion, public and academic, about rising levels of consumption is often couched in terms of scarcity and excess, which is unhelpful when deployed as morally loaded terms to impute character defects, personal failings, sloth and greed. In his intriguing conceptual disaggregation of the terms excess and scarcity, Abbott (2014) reveals how these terms are inter-changeable, subjective and can be applied generically across a range of quite specific instances of judgements of too much or too little.

In breaking down the conceptual variants of the terms scarcity and excess, Abbott first shows that whatever constitutes too much or too little is subjective, relative and contextual (take e.g. the different connotations of terms such as rarity, uniqueness, insufficiency and paucity, which are all interpretations of scarcity; or bountifulness and gluttony which both derive from excess). Second, that what might constitute too much or too little is inter-changeable across scales (from individuals to societies) such that neither term can be understood independently from the other nor can they be presented as a simple binary. And yet, despite this, Abbott

argues, social theory has principally been concerned with scarcity, and when excess is considered it is done so in juxtaposition to scarcity. To provide one clear example he discusses Becker's (1965) account of the excess of consumption goods that resulted from increased industrial productivity during the nineteenth century. Becker's analysis effectively presented the excesses of consumption as resulting in a scarcity of time, because consuming places increased burdens on the time budgets of consumers.

It is important to recognise the conceptual limitations of terms like excess, but we cannot ignore the fact that current levels of consumption of goods and services damage the environment. Ultimately, we maintain that the solution can only be to combat *over-production*. Maintaining consumption at levels consistent with the carrying capacity of the planet entails capping the volume of products in circulation. However, prescribing how to do that is tremendously difficult. Often when faced with such intellectual and practical dilemmas, we turn to history for clues. However, in the past no necessary upper limit to the volume of consumption was required. Of course, moral and religious considerations have prescribed ceilings for individuals, encompassed by concepts like waste, thrift, luxury, ease, which deem materialist values corrosive of individual character and social life. On such grounds, limits to consumption of specific goods at particular moments were (and still are) followed, whether fasting at particular times of the year (Lent, Ramadan) or the observance of eating fish or meat on specific days of the week (Southerton, 2020). However, until environmental degradation, depletion of natural resources and climate change came to be recognised as requiring urgent attention, there was no compelling objective reason for restricting overall levels of material consumption. The only modern context in which limitations to consumption have been imposed across capitalist societies by political fiat is rationing during war, not to counter excess or abundance but to ensure a minimum sufficiency for every citizen.

The climate crisis presents an overwhelmingly powerful reason for establishing a collective maximum level of consumption. The world's population has a collective and joint ceiling for environmental harm consequent upon available raw materials and processing techniques. While we can hope for new technologies to reduce damage, few believe that to

be sufficient and that instead current modes of production and consumption must change, especially in the rich countries (e.g. Alfredsson et al., 2018). However, global limits are not easy to define. There are a huge number of potential trade-offs (more online communication and less travel; bicycles rather than airplanes; warmer clothing rather than central heating). Once we consider the multitude of practices whose techniques and technologies use up natural resources the scale and scope of the problem becomes tantalising.

Despite these technical and conceptual problems, many sometimes admit that they themselves have too much. Probably even more agree that other people have too much. In addition, there is consensus (at least in most affluent nations of the world) that climate change requires urgent and radical action at scales from the global through to the individual (Geels et al., 2015). The problem as presented by Wilhite and Lutzenhiser, that environmental sustainability is fundamentally a challenge of escalating levels of material consumption, remains (IPCC, 2018). Returning to the concepts of social loading and justifications for idle capacity of material goods might lead to at least partial remediation.

Just-in-Case

JiC is invoked as a rationale for justifying the acquisition and maintenance of material infrastructures to meet peak loads. Wilhite and Lutzenhiser's analysis of energy consumption examines the service outcomes of the use of energy rather than just the volume of energy used. Similarly, contemporary studies of consumption emphasise that standards and expectations related to social practices also underpin the accumulation of material goods (e.g. Shove et al., 2012; Sahakian & Wilhite, 2014).

To explore the conceptual merits of JiC in the context of material consumption we need to briefly recall Wilhite and Lutzenhiser's four 'social determinants' of base and peak loads: (a) status and display; (b) sociality and conventions; (c) security and convenience; (d) systems and structures.

These four determinants underpin base levels of consumption. Tastes act to reproduce levels of material consumption because they communicate, display and (re-)affirm senses of belonging to, and differentiation

from, groups based on interpretations of social status. The competent performance of social practices requires knowledge and skills related to the norms, conventions and appropriate use of goods and services within contexts of social interaction. Understandings of security and convenience, or of the risks attached to any sets of consumer goods together with the most effective use of time and effort in using those goods, also determine societal base loads of material consumption. Finally, base loads of consumption are made possible through the affordances embedded in infrastructures and institutional structures that govern energy services (or social practices). According to Wilhite and Lutzenhiser, the 'base load' of material consumption necessary for a satisfactory social life is regulated by these four determinants.

Each determinant also provides rationales and justifications for the just-in-case arrangements that underpin peak social loads. Status and display include aspirations and ambitions that can, at least in part, be realised through the accumulation of material possessions. Conventions and norms of social interaction are dynamic and vary across social groups, and this fosters tendencies towards the accumulation of consumption goods to cater for variety and diversity 'just in case'. Pragmatism also dictates that 'over-dimensioning' of material goods is necessary to mitigate perceived risks and maximise convenience. Wilhite and Lutzenhiser give examples of reserve stocks of goods such as food not just to manage shortages but also to cater for the unexpected arrival of guests. And, having multiple options for the preparation of food (access to take-aways, microwaves, ovens) or multiple transportation options per household offers scope for greater convenience when it comes to the organisation and coordination of household mobility activities. Finally, the infrastructures and institutional structures of contemporary societies both provide the capacity for just-in-case provision, and in so doing make explicit fears and anxieties related to the three other social determinants. In this respect, Wilhite and Lutzenhiser highlight how marketing (both business and social), advertising and media representations normalise peak loads and present those peaks as reasons why increased infrastructural capacity is 'essential'.

JiC thus provides a rationale for the accumulation of material goods in anticipation of 'peak loads' of social activities. It can be framed in positive

terms: seeking pleasures and enjoyment; shared meanings and activities; resilience and reduced labour; and as infrastructures and systems that provide greater choice and provision. But it can also be framed negatively as waste, redundancy and greed. A wide range of scenarios may elicit justification of additional provision of material goods likely to be under-utilised, including:

- Emergency, in which estimations of risk are judged against a set of possible scenarios such as infrastructural or technological failures (e.g. electricity blackout) and threats of disruption (e.g. a pandemic);
- Irregular need, in which people keep to hand and exercise personal exclusive ownership over items which are only occasionally deployed, such as umbrellas, charging equipment, tools for home maintenance;
- Unexpected events, where extra capacity may be required to accommodate guests who visit the home (e.g. a spare room, stocks of refreshments), for special occasions or infrequent journeys (e.g. a large car to transport adult children to University);
- Anticipated spells of boredom, which can involve items for individual entertainment such as reading material (spare books) or to accommodate collective entertainment (board games, toys for visiting children);
- Anticipated future practices, which may involve, for example, kitchen, gym and sporting equipment;
- Revisiting past practices, whether to recall lessons learned from error or misfortune or for purposes of nostalgia. Examples might include technologies such as old phones, video recorders and cameras retained in order to watch family videos, musical instruments and childhood toys to be passed on to future family members, and items purchased by mistake (e.g. clothing or home furnishings) that might be put to use by a friend, family member or retained in case of a change of mind.

There are many studies of material accumulation, although rarely expressed in the terms of JiC. In her account of the 'Time Bind' Hochschild (1997) described fathers purchasing camping equipment as a commitment to an idea and aspiration of competent fatherhood only for that equipment never to leave the garage. Similarly, Sullivan and Gershuny's (2004) analysis of kitchen goods demonstrate that across the

UK significant volumes of bread makers, blenders and other equipment are owned by households but rarely, if ever, used. They conclude that kitchen objects are purchased based on aspirations to use in the future JiC the opportunity should arise. And, Brembeck (2019) demonstrates how the accumulation of stuff just in case of exceptional, irregular or aspirational needs and wants, or just in case that an object may be re-used at some future time, underpins a significant increase in domestic space and storage facilities devoted to these accumulated material goods. She reveals that in the USA 3000 new storage facilities were built every year between 2000 and 2005 and, despite the average citizen's living space growing, one in ten US citizens rented a storage unit by 2013. While Europeans lag behind, similar trends in renting storage space apply: in 2017 the British had 0.5 square metres of storage space per person, the Dutch 0.47 and Swedes 0.4, which compares with 0.7 per resident of the USA (Federation of European Self Storage Associations (FEDESSA), 2014).

The JiC scenarios above are easily recognised, widely accepted as legitimate and can indeed be justified on a case-by-case basis. Spare capacity in the British National Health Service would have been a sensible precaution in the face of COVID-19 when peak load for the delivery of intensive care services was reached much too soon in the face of spreading infection. The positive consequences for social relations and human happiness of generous hospitality are to be welcomed and treasured. Making preparations for more active leisure with its effects on health and strength is unobjectionable. Hence, framing the resulting accumulation simply as matters of 'excess' misses the point, since social loading (base and peak loads) and the scenarios to which JiC logics can be applied, represent legitimate and meaningful elements of the organisation of everyday social practices. There is nonetheless a problem, which is the collective limits to the use of material resources which are damaging to the environment, let's say, in sympathy with Wilhite and Lutzenhiser, the use of sources of energy which emit unsustainable levels of GHGs. The notion of a collective maxima is, as we discuss above, a new situation when considering consumption patterns, one which Wilhite (2016) was well aware. Both a theoretical and a practical problem concerns how the malign effects of the activities of billions of individuals acting independently can be demonstrated, calculated and modulated. We have one recent example of a

potential solution with respect to reducing the environmental effects of food provisioning advanced in a recent report.

The 'EAT—Lancet commission on healthy diets from sustainable food systems' is a remarkable document (Willett et al., 2019). It goes some way towards offering a viable template for consideration of what might be enough, and how enough (not too much and not too little) might ideally be established through a scientifically informed thought experiment. It identifies a 'universal healthy reference diet' which could match best possible estimates of the nutritional needs of a global population of 10 billion people in 2050 consistent with the environmental carrying capacity of the earth. It concludes that the food system needs to generate approximately 2500 calories per person per day, with an appropriate balance of foodstuffs delivering sufficient protein, carbohydrate and fat to satisfy nutritional guidelines. The rationale for the diet's components lies in environmental limits. The report explicitly uses estimates and projections consistent with best current expert knowledge to propose modifications to current diets. Climate change, water shortages, chemical despoliation and soil depletion are incontrovertible trends to which future imaginable technological innovations will fail sufficiently to remedy without radical change in food consumption. Environmental constraints make this a zero-sum game; only a limited number of calories can be made available safely for consumption globally and if some individuals, groups or countries take more than their share then others will be deprived and malnourished.

The report presents the problem as one of collective management of the production of food on an international platform. It recognises there are many different ways to meet the nutritional standard and the variabilities of production possibilities and cultural taste across the world. EAT pays little attention to what exactly will be ingested. It is not prescriptive in that sense and retains a large element of consumer and cultural choice. It recognises a maximum global carrying capacity, estimates an optimal per capita distribution of calories and nutrients. Thus, it matches a collective maxima for the exploitation of natural resources to a standard of individual need, but without prescribing or allocating specific foods. Arguably it could thus perform all the four functions of consumption identified by Wilhite and Lutzenhiser, yet within environmentally safe limits. EAT, that is to say, has a clear criterion for what constitutes

enough, by establishing that neither more nor less is sustainable. It is of course an ideal, a basis for discussion. Can this form of reasoning be extrapolated to other forms of consumption? We think that an inquiry into the rationales invoked in just-in-case situations indicates that it might, and that this could contribute to changes in behaviour.

The possibility of establishing the needs of any individual with respect to calorific intake makes eating a specific case and one where it is *prima facie* much easier to formulate an equation indicating how preservation of the planet and the distribution of a necessary portion of resources to individuals might be aligned. We can say how many calories a woman needs. However, we cannot so easily say how many miles she needs to travel, how many recreational activities she needs to participate in, or to what temperature she needs to heat her dwelling. We can say that in all probability the dirty materials subtending her lifestyle, if she lives in the UK, are greater than the per capita limit that the collective tariff allows. And, among the most important reasons for transcending collective limits are the celebration of variety within contemporary consumer culture and the hegemonic belief that wherever possible she should provide for herself through private ownership and exclusive use of the items required to support her desired lifestyle.

There is much to be said about each of these pressures—the analysis in the last decades of the sociology of consumption underpins the claim (e.g. Evans, 2019). Briefly, however, there has been a tendency for affluent people to expect to engage in a much greater diversity of practices, and to seek variety within each. The mean number of exposures to different forms of cultural entertainment has grown; for example, most people (in the UK) now eat out and the diversity of cuisines which are experienced has broadened (Warde et al., 2020). Second, commonly thematised in terms of convenience, spatio-temporal coordination of relevant personnel in many diverse work and recreational activities requires additional resources (Southerton, 2020). The third tendency is the accumulation over recent years of goods intended for exclusive domestic consumption, like the automobile or miniaturised domestic technological instruments like *en suite* bathrooms, multiple televisions and kitchen equipment (Trentmann, 2016). This is partly the expression of an entrenched ideology of domesticity and privacy which pervades European

societies, and which is often mis-described as individualisation. It also results partly from the commodification of formerly public services and privatisation of collective activities—all motivated by the drive for profits and the political prioritisation of economic growth (Wilhite, 2016).

A possible simple and rational solution to the collective requirement would be to discourage and limit access to diversity of practices or restrict the sales of dirty items to private households. However, politics is not a domain of rational action. These are unlikely remedies in the current neoliberal conjuncture when the restriction of access would signify a cultural and economic revolution. Nevertheless, they may draw attention to issues of how to make more economical and efficient use of the dirty materials that are in circulation to serve the practical functions that variety and exclusive ownership currently satisfy. The principal currently canvassed candidates for this include ideas of a circular economy, defence of the commons, mutual provisioning and the sharing of materials and amenities. Eliminating harm attributable to JiC overstocking will probably require engagement with such concepts. This is an extensive and complex issue about which we can only make a small contribution to the bigger picture. A critical appreciation of JiC justifications reveals sources of surplus material possessions and the possibilities of doing something about it.

Four Options for the Re-configuring the Provision of JiC Modes of Material Accumulation

Strong suspicion, and appropriate caution, is necessary when considering JiC rationalisations because, as Wilhite and Lutzenhiser point out, they operate as a multiplier of excessive possessions and infrastructural capacity. Seeking strategies for minimising the negative effects of JiC acquisitions, we identify four options through which justifications might be challenged so as to reduce overall volumes of material consumption. The options are not mutually exclusive and intersect in multiple ways. The first draws attention to the problem at the level of the individual

confronting potentially surplus items. This is often addressed in ways like: asking, 'do you really need that?'; adopting principles of one-in one-out as with decluttering; expressing abhorrence of the extravagances of the plutocracy; or by conducting a household inventory of possessions. Second, reviews of JiC reasoning can be employed in contexts in which shared and inter-connected (or bundles of) practices are performed. A third option is to consider opportunities for reducing private possession and exclusive access to items to which collaborative consumption offers an alternative. As nascent examples related to the sharing economy indicate, collaborative modes of consumption can be realised through emergent configurations of market and non-market actors to provide shared services or to avert self-servicing through the private ownership of material goods. Finally, and perhaps most ambitiously, digital applications might be harnessed to provide systems that cater for JiC justifications in novel manners.

The first, most orthodox and most familiar option would get individuals to recognise which little utilised items are being consumed or stored JiC of specific eventualities and to expose their environmental impacts. This might persuade some people that, given the environmental costs, they have no need of the items, should probably discard them and certainly should not replace them. How would they decide what to abandon? Abstract 'valuations' of goods and services capturing environmental externalities in terms of embedded carbon could be defined, and allowance per citizen of total carbon from everyday consumption calculated. Voluntary monitoring of carbon budget calculations is also difficult—it is relatively straightforward to compare the carbon costs of a car journey to work when compared with a train; or of coal-fired domestic heating compared with solar panels. But when it comes to comparisons across different consumption sectors (such as food and transport) and between individual versus household or other forms of collective consumption the calculation becomes ever more complex (see Southerton & Ulph, 2014, for a discussion). Even if an absolute level could be agreed, mechanisms for monitoring and enforcing limits would be problematic. Rationing is in principle possible, although it would not be popular politically. A per capita limit might be enforced, although if done by price there would be

a concern that the rich could afford to flout pecuniary regulations and pay to exceed their allowance.

Despite these difficulties, some possibilities deserve consideration. Life Cycle Analysis (LCA) provides robust methodologies for calculating the environmental footprint of individual goods and services. Three aspects need to be considered: (a) production and distribution; (b) maintenance and storage; and (c) impetus to use and disposal. The environmental impacts of any consumer good vary across these three aspects. Take the power drill as an example. According to Botsman and Rogers (2010) the average domestic power drill is used for between 12 and 15 minutes of its entire lifetime. Its environmental impact is, therefore, principally embedded in its production and distribution with perhaps a small impact related to its storage and limited impact from its use phase. By contrast, for a private car the largest environmental impact is from its use and disposal phase, even though the average car remains idle for 95% of its lifetime (Bates & Liebling, 2012), and the implications of both production and distribution and of storage and maintenance are also high. Both, following the logic of JiC, are retained in order to have goods on hand for when needed. The total environmental impact of objects 'being on hand' might be captured in LCA metrics with contrasts offered for alternative options (e.g. renting or sharing) to offer some basis upon which the individual might evaluate and perhaps reconsider the environmental impacts of JiC accumulations of goods.

The limitation of consumer information policies, such as carbon labelling (see Hornibrook et al., 2015), is well-rehearsed. They are policies principally focused on decisions taken at the point of purchase and reliant on consumers' having the capacity and willingness to exercise judgement vis-à-vis a bewildering criterion of ethical, cultural and economic factors. However, this does not mean that the calculation of the environmental impacts of goods stocked for exceptional episodes would not raise awareness and suggest generic rules of thumb to expose the real cost of material goods accumulated JiC.

A second option, and extension to individual consciousness raising, is to make visible the environmental implications of under-utilised items and resources in the contexts of shared and inter-connected (or bundles of) social practices. Rather than limit attention the decision making of

individuals focused on singular goods, this option focuses on calculating the environmental implications of sets of shared social practices for which multiple goods and services are enrolled. Laundry practices are an example (see Mylan & Southerton, 2018). Doing the laundry comprises multiple activities: sorting and storing clean and dirty items, washing, drying, folding, ironing and so on. Those activities nestle within sets of inter-connected practices, such as school and work-based practices, recreation and recuperation. The multiple activities and bundles of practices both generate justifications of need and shape the ways in which laundry practices are performed. To reflect the environmental implications of these sets of inter-connected activities LCA metrics might be compared across alternative arrangements of suites of activities (e.g. washing plus drying plus ironing) to reveal, for example, the difference between self-service provisioning arrangements of domestic laundry and the use of collective (whether commercial or otherwise) laundry systems.

The same principles could also be applied to the spaces in which bundles of practices collide or congregate. The environmental impact of the domestic kitchen, a space in which significant JiC provisioning is located with respect to eating as well as laundry practices, could be calculated based on the extent to which different practices are performed within it. LCA might be utilised to measure the footprint of spaces (a shed, garage, loft, kitchen, office or bedroom) based both on the goods contained within them and the bundles of practices in which the goods are (or are intended to be) used. Households might then be encouraged to compile inventories to estimate environmental impacts of JiC provisioning for peak loads.

The third option shifts attention from current JiC arrangements to alternative modes of provision. At the core of this option is the replacement of dominant cultural norms of private possession of material goods in favour of collaborative consumption (Wilhite, 2016: 112–115). This shift is often referred to as the sharing economy (see Arcidiacono et al., 2018 for a systematic review of empirical studies). In their excellent critical analysis of the sharing economy, Frenken and Schor (2017) delineate between the many applications of the term. In doing so they observe that ‘sharing’ has become a marketing concept of significant value because of its emphasis on authenticity, personal relationships

and de-commodification: sharing is culturally valued and cherished, and for Frenken and Schor this is because meaningful relationships and interactions are based in sharing (see also Belk, 2009). While the marketing world nefariously hails 'sharing' as novel (a classic case of what historians describe as presentism), what is new about the phenomena observed within the term is that people are prepared to share with strangers (Schor, 2014).

Once the hyperbole of the marketing world is removed, at the core of the sharing economy is *'consumers granting each other temporary access to under-utilised physical assets ("idle capacity")'* (Frenken et al., 2015). Benkler (2004) identifies cars, rooms in homes, clothing or food items as common examples of 'sharable goods' of which many consumers have 'excess capacity'. As Frenken and Schor also observe, not only are significant volumes of consumer goods accumulated within the typical home where we find excess capacity, but the logic extends to many 'new' goods like cars, computer memory, washing machines and so on, which are often advertised and marketed on the grounds that they come with extra capacity.

Frenken and Schor (2017) define the sharing economy as premised on the principle of sharing the 'idle capacity' of goods for the purpose of performing common practices. In this definition, however, Uber—a leit-motif of sharing economy hyperbole—is *not* an example of sharing. Uber does not offer idle capacity but a commercial service in which the user can order a taxi journey. Without the order the journey would not take place. By contrast, hitchhiking or carpooling is sharing because the journey is happening anyway and the idle capacity in the form of a car seat is 'shared'. In the case of another popular example, Airbnb is sharing when a homeowner rents out a room in their home but is not when someone purchases a property for the purposes of renting out spaces within it. Environmentally positive sharing occurs only if idle capacity is shared between consumers in the form of physical goods or services that are offered based on immediate need.

Opportunities for sharing idle capacity of goods and services could reduce the total volume of material goods in circulation. Botsman and Rogers' (2010) examples of power drills and cars are interesting because they spend most of their lifetime out-of-service. Embedded in each good

is significant idle capacity—stored up in sheds, garages and parking lots—which, if shared, would significantly reduce the volumes of those goods. Suggestions would include neighbourhood or community stores for household goods, car-sharing pools in which members pay a subscription and service charge per use, and local networks in which members share or exchange services based on their expertise. For the purposes of our argument, whether sharing idle capacities of goods and services is mediated through market or non-market actors is less significant than their potential to meet unusual or occasional requirements through minimal levels of material goods. A commercial service may well be the only feasible option for car-sharing at scale, but local networks and community sharing arrangements (such as community supported agriculture, and local second-hand economies) may operate based on collective ownership and collaborative consumption, illustrating diverse means through which imagined JiC obligations might be provisioned by sharing idle capacity.

A fourth and final option builds on the principle of sharing to problematise and replace the orthodoxy of private possession and self-servicing. Debates about sharing, especially with strangers, are almost entirely predicated upon the emergence of digital or platform economies (Srnicsek, 2017). Digital platforms, whether as websites or digital applications, are of three broad types (see Bygstad & Dulsrud, 2020). *Pure* platforms, or multi-sided digital ecosystems, refer to peer-to-peer networks consisting of consumer-to-consumer interactions (e.g. file-sharing platforms). *Window* platforms facilitate goods being exchanged between multiple producers and the consumer (e.g. Amazon marketplace). *Direct* platforms offer a direct link between a producer and consumers (e.g. the online supermarket). Fundamentally, the emergence of digital platforms facilitate sharing, whether through peer-to-peer networks that offer the scope for provisioning of goods and services outside of market modes of exchange or through digital applications which facilitate sharing as the basis of a social enterprise (or B-Corp) business model. ‘Too Good To Go’—a digital application that enables users to share unused food in advance of its use-by date—is a good example of the latter (for discussions of digital platforms and food consumption see: Heidenstrom & Hebrok, 2021; Samsioe & Fuentes, 2021; Southerton & Fuentes, 2021).

The potential of digital platforms to facilitate the sharing of idle capacity has yet to be the subject of systematic empirical enquiry. Such an enquiry would need to examine the use of platforms publicising idle capacity, consider how they compete with the dominant direct platforms operating with conventional models built on private ownership of material goods, and determine the extent to which they deliver positive environmental outcomes once unintended consequences and rebound effects are taken into account. The measures of environmental impact outlined in options one and two above could be used as a basis of empirical evaluation of the capacity of such platforms offering also the opportunity to consider how the powerful algorithms of the digital platforms might inform JiC justifications at both the individual and practice-based levels. Platform algorithms are often feared; images of Big Brother manipulating personal data to encourage more consumption portend doom (Zuboff, 2019). However, if used to draw attention to alternative means of provision, such algorithms could play a positive role in managing types of peak social loading identified by Wilhite and Lutzenhiser over 20 years ago. After all, we do not need to over-provision to meet unpredictable needs if we have digital applications at our fingertips to direct us towards other consumers or networks with idle capacities in the very goods or services required to perform those practices.

Conclusion

The fundamental object of this inquiry has been what counts as credible and admissible justifications for levels of material possessions given the environmental damage associated with their consumption. For Wilhite and Lutzenhiser the problem is not simply volumes of consumption but the ratcheting effects on ordinary, or base, levels of material consumption of extra provision 'just-in-case' a peak load arises. JiC is a justificatory rationale for accumulating more stuff. We have suggested some means for revealing to individuals the effects of the consequent additional levels of material possession. We have also pointed to the value of transitioning from private to shared possessions and from ownership to use of services. These are means to reduce the volume of goods in circulation while also

ensuring that optimum environmental standards are met when catering for both base and peak loads. Car pools and service subscription systems already exist. Ownership of automobiles has been declining in the UK, especially as younger generations appear content to pay for services over goods. Clothes are more likely to be rented today than they were in the past (Lang & Joyner Armstrong, 2018). Environmental standards (for homes, heating, transport) also exist. However, these developments seem piecemeal, fragmented and disconnected. There is no momentum to implement thoroughly, universally, and with necessary speed, responses proportionate to a climate emergency. The forms of calculations we suggest might reveal some of the tensions and contradictions associated with, as well as clarifying options for, reducing the environmental costs of material consumption.

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