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Consumption

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I. Introduction

Consumption is a major contributor to environmental degradation and change. However, it was not until 1992—at the United Nations Conference on Environment and Development)—that consumption was seriously addressed by the global community. The consensus that emerged was that the global South had a "population" problem and the global North had a "consumption," or more correctly, an "overconsumption" problem. It proved to be a durable formulation. Within environmental sociology, the prominence of the IPAT (Impact = Population x Affluence x Technology) equation (Ehrlich and Holdren 1971) has contributed to this framing of the environment/consumption relation, although the rise of a global middle class suggests that consumption is increasingly a global concern, particularly with respect to climate change. The implication of consumption as a central problem has led to the application of sociological theories of the "drivers" of consumption, a robust literature on "sustainable consumption," and sectoral studies of particular types of consumption. Given the variety of topics within the field of consumption, this review is not comprehensive. We have omitted some major environmental concerns such as toxics, water, and food, which are covered elsewhere in the volume. In this paper we focus on incorporating consumption theory into environmental sociology. While environmental sociologists have made considerable progress toward understanding consumption in recent years, the field has historically been more oriented to studying production and the state, as its major theories focus on those areas. However, the recent expansion of research in the sociology of consumption more generally is productive for advancing this area within the sub-field.

We begin with the question of how consumption is implicated in environmental degradation, and in particular the reasons for ecologically-destructive levels of consumption in the global North. We then ask whether the global South is following the same path. And finally, we address the possibilities for a

"sustainable consumption" system. In the latter, we pay particular attention to Information and Communication Technology (ICT), energy, and transportation, and how these factors relate to climate change.

II. Consumption and Environmental Degradation

Consumption and Ecological Overshoot

In the 1970s, scholars began developing models that suggested economic activity was putting unsustainable stresses on the planet. The "World" model of Meadow and Meadows, popularized in their 1972 book, *Limits to Growth*, (Meadows 1972) predicted that the planet would shift into "overshoot," or unsustainable rates of growth in the early 21st century. While population was clearly an important element of their model, the model's focus on industrial production put consumption squarely at the center of what became a lively debate about overshoot. By the 1990s, analysts undertaking this type of macro analysis developed the concept of the "ecological footprint," a measure of the demand from economic activity (Wackernagel and Rees 1995). The ecological footprint measures the land and shallow sea water necessary to support the annual consumption of a nation, city, household, business, or any other unit with well-defined consumption. It includes the amount of forest area needed to sequester the CO_2 emitted from economic activity. And unlike many other ecological metrics, such as official CO_2 emissions, the ecological footprint is consumption-based, meaning it includes imports and excludes exports. Footprint analysis suggests that the planet went into overshoot in 1970 and that the gap between bio-capacity (the sustainable level of consumption) and footprint has continued to widen. (Global Footprint Network. N.D.a). In 2016, the latest year for which data is available, the global footprint stood at 1.69 "earths," meaning that humanity consumed 70% more annually than is compatible with the reproduction of the planet's bio-capacity. That year, the per capita footprint of the world was 2.75 global hectares (gha), in comparison to a bio-capacity of 1.63.

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Consumption is highly unequal across the globe. The per capita footprint of North America is particularly high, at 8.07 gha, or almost five times the sustainable level. The average footprint for Europe is 4.56 gha. East Asia and Latin America and the Caribbean have lower, but still unsustainable per capita footprints of 3.73 gha and 2.59 gha, respectively. By contrast, South Asia and Africa are still below the sustainable global footprint at 1.19 gha and 1.36 gha, respectively.

The carbon portion of the ecological footprint varies considerably across the world as well. North America and East Asia have the most carbon-intensive footprints, with roughly 70% of their total impact attributable to carbon. In Europe carbon counts for over half at 60%, in South Asia carbon accounts for about half, and in South America and Africa the fraction made up of carbon is 34% and 30%, respectively. These differences in carbon footprints suggest that consumption patterns differ considerably around the world, and that more highly industrialized regions are more reliant on carbon to reproduce their lifestyles, a finding that accords with a considerable literature on the drivers of carbon emissions (Global Footprint Network. N.D.b).

A large literature within environmental sociology analyzes the drivers of ecological footprints, and related measures such as carbon emissions, carbon footprints (a consumption, rather than territorial based measure), and deforestation. The most common formulation is a version of the well-known IPAT accounting (Impact = Population x Affluence x Technology). Sociologists use a stochastic version (STIRPAT) of this identity (York, Rose, and Dietz 2003). The main findings of this research are that population and "affluence" (measured as GDP) are key drivers of environmental outcomes. Other variables such as industrial structure and urbanization are also typically included. This literature is discussed in chapters TK and TK of this volume. For the purposes of this chapter, the key variable is Affluence. While sociologists have used the IPAT formulation to develop a large literature on the drivers of multiple environmental outcomes (e.g., forests, carbon emissions, eco-footprints), there is also a literature which is critical of its focus on population. The "population bomb" discourse of the 1960s and

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1970s, promoted by IPAT author Paul Ehrlich, has been tied to state violence against global South and marginalized global North populations, particularly women (Hartmann 1995).

Patterns of U.S. Household Consumption and Carbon Emissions

We move now to the household scale, as most approaches to consumption limit their focus to households. We note that government and business also contribute to consumption, but most business activity is accounted for under investment, and government consumption is typically studied separately as well—an artefact of national accounting conventions. For reasons of space, we will confine ourselves to measures of U.S. households. Most of the household based accounting of environmental impact in recent years has considered carbon emissions, rather than broader measures such as eco-footprints (Jones and Kammen 2011, Figure 1. See also Weber and Matthews 2008 for similar findings.) Households are estimated to directly contribute 38% of all U.S. CO_2 emissions (Gardner and Stern 2008).

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Jones and Kammen (2011) have produced one of the most comprehensive and influential studies of household carbon emissions, combining data from the Consumer Expenditure Survey with production side data from input-output tables that analyze the carbon used to produce goods and services. This approach allows for the calculation of both direct emissions (such as household fuel use) and indirect emissions (carbon embodied in the manufacture of products). In 2005, the average U.S. household produced a total of 48 tons of CO_2 per year. On a per capita basis that is about 20 tons per year. The largest portion of the total is transportation, which accounts for 32%, with motor vehicle fuel representing more than half of the more than 15 tons emitted. The second largest category is housing, at 28% (or roughly 13 tons), and within housing, electricity is the largest contributor. Food is the third largest category, at 15%, with meat and dairy responsible for roughly 3 tons per year. Goods and services each lead to roughly 6 tons, or 12% and 13%, respectively. Within those categories, the largest components are entertainment, clothing and health care. According to Weber and Matthews (2008), roughly 30% of the U.S. household carbon footprint is accounted for by imports.

These are national averages. There are considerable differences across a variety of metrics, including location, household size, and income. The highest metropolitan area carbon footprint is from Minneapolis, which exceeds 50 tons, largely on account of the need to use more heat in the cold winters. Transportation emissions are especially high in California cities (Los Angeles, San Francisco and San Diego). Densely populated urban areas in the Northeast have some of the lowest carbon footprints (New York, Philadelphia, and Boston), as do cities in warm climates (Tampa, Honolulu). Household size also matters, as expected, with larger households emitting more carbon. However, the effects are not proportional, with the jump from one to two persons leading to a much larger increase than for additional persons above two, indicating economies of scale. For example, two single person households have the same emissions as a typical family of two adults and two children. Weber and Matthews (2008) find that beyond a household size of three, the emissions do not increase, on account of shifts in expenditure type and the fact that transportation emissions do not rise for households larger than three persons.

Income levels are an important determinant of emissions. Jones and Kammen (2011, Figure 2) find a doubling of emissions with an increase from their lowest category (<$10,000) to their highest (>$120,000). Weber and Matthews (2008) find an even larger spread across the income scale. They also find that lower income households generate more of their emissions from "necessities" (food, housing, utilities and transportation) and higher-income groups emit more by purchasing furnishings, clothing and footwear, goods (including electronics), and personal services. As with other studies of the importance of disproportionality in environmental outcomes (Freudenburg 2005; Jorgenson, Longhofer and Grant 2016), researchers are beginning to explore consumption disproportionality at the household level. For example, one study of food consumption found that the top 20% of consumers accounted for 27% of meat, and 28% of dairy consumption respectively. Overall, the top quintile was responsible for 7.9 times the emissions of the bottom quintile (Heller et al 2018).

These differences across households are one reason that some researchers are critical of the IPAT formulation, which typically considers only national averages. When income inequality is high, as it is in

many countries, IPAT can lead to policy approaches that focus on all households, rather than high emitters (Chakravarty et al 2009). At the global level, the disproportionality in impacts is most extreme. Chancel and Piketty (2015) find that the top 10% of carbon emitters are responsible for 45% of global emissions, while the bottom 50% contributed only 13%. Income is the most important determinant of this distribution. Among all countries, the top 1% of U.S. emitters, who earn considerably more than half a million Euros per year, have the highest levels— 318.3 tons of CO_2 per capita. This is 50 times the world average of 6.2, and also far above high emitters from other countries.

On all the major categories of U.S. household consumption, expenditures, and typically, environmental impacts, have risen over time, especially if we consider the post-World War II period which environmental scholars have termed the "Great Acceleration." In 1961 the U.S. footprint stood at 8.05 gha. It rose to a high of 11.11 in 1973 gha, and hovered in the 9-10 gha range until the financial crisis and recession that began in 2008, after which it began to fall to its current level of 8.1 gha. The major components of the household footprint also rose over this period (see Ehrhardt-Martinez and Schor 2015 for sources). Residential energy use rose by nearly four times between 1950 and 2010. For much of this period, personal transportation metrics—cars per person, miles driven per car, and fuel consumption per passenger vehicle—also rose. The environmentally most damaging parts of diets—meat and dairy—also increased significantly after WWII, with the former increasing 80% since 1950. Goods purchased also increased substantially, which can be seen in overall expenditure data, but also in calculations of units and weight in consumer items (Schor 2010, ch 2). Between 1991 and 2007, Americans doubled their annual purchases of new apparel from 34 per year to 67. More recently, some observers have argued that the U.S. has reached "peak" oil, peak driving, peak meat, and perhaps peak consumption (Pearce 2012). How much of the current slowdown in these activities and products is due to the recent slow growth in incomes and GDP, and how much is being driven by other factors remains to be seen.

Incorporating Households into Environmental Sociology

Within environmental sociology, the role of household consumption as a driver of environmental impacts has traditionally been neglected. The two dominant approaches in the sub-field—the treadmill of production (Gould, Pellow and Schnaiberg 2008) and ecological modernization theory (Mol, Sonnenfeld and Spargaaren 2009)—both focus on corporations and government, rather than households. Environmental drivers are thought to be structural, as in the cases of systemically-induced output growth, or growth-driven state policy. Households have traditionally been thought to play a relatively passive role in a system in which structures of production and the market determine environmental outcomes. While ecological modernization theory has addressed its early neglect of consumers, much of the analysis of "consumption" has been done at the macro level, with formulations such as SITRPAT. One influential approach (Szasz 2007) takes an explicitly anti-consumer view, arguing that focusing on consumers' role is counter-productive. Szasz claims that when consumers act *qua* consumers, purchasing environmentally positive products in order to avoid hazards and toxins, they engage in an "inverted quarantine." He believes this purchasing behavior undermines people's willingness to engage in collective action to address environmental problems. Because solutions require state action and systemic change, consumers become the problem, rather than part of the solution. There are, of course, exceptions to the focus on corporations and the state. There is a sociological literature on household energy consumption. Environmental sociologists have also considered individuals as participants in social movements (Brulle 2000). An influential contribution by Dietz et al (2009) estimated that relatively easy efforts to reshape household decisions and practices could reduce carbon emissions by at least 7.4%. And more recently, scholars who are interested in sustainable consumption, and attempts to move societies in that direction, have focused more on households.

Sociologists approach the study of consumption differently than economists and most psychologists, two social sciences that are prominent in environmental policymaking. The latter two disciplines take a more individualist approach. By contrast, sociology, and sister disciplines anthropology and history do not ignore individuals but focus considerable attention on the larger context in which

people live—including culture, history and the social and economic structure. Thus, sociologists understand that individuals and households are embedded within contexts that may reduce their ability to act independently, or that may have strong impacts on their preferences and actions.

As an example of these disciplinary differences, consider the question of mobility. The economic approach focuses on the costs and benefits to an individual of alternative models of mobility, reasoning that if people are driving private cars it is because they "prefer" them, and have the money to enact those preferences. Economists' most common policy response to discourage car use is to make the cost of private automobiles more expensive, to alter the cost-benefit calculus and reduce car ownership and use. One exception is behavioral economics, originally developed by psychologists (Kahneman 2011), which argues that humans have innate predispositions, such as loss aversion, fairness norms, status quo bias, threshold effects, and other non-rational responses to how situations are framed. Behavioral economists advocate incorporating these features of human action into policy design, although they have not been much deployed in environmental policy. Psychologists tend to focus on values and attitudes and attempt to understand why stated values and attitudes are not consistent with behaviors—a phenomenon termed the attitude-behavior gap (Ehrhardt-Martinez 2009). Education and attempts to transform values are common policy responses within psychology. By contrast, sociologists look at the use of automobiles within the larger context, identifying either the symbolic meanings of these consumer items, or more recently, the "practices" that people enact with autos. They focus on connections among individuals, and especially peer, or network effects, in contrast especially to economics, which has traditionally modelled consumers as isolated individuals. Sociologists believe that historical experience is important for understanding consumers' actions, as well as the socio-technical and natural systems in which people are embedded. More generally, sociologists attempt to incorporate both "structure" and "agency" in their approaches to consumption, although they often lean toward one or the other. In the case of mobility, sociologists look at issues such as the post-WWII highway infrastructure and suburban development (Rudel 2009), the status value of cars and their role in identity construction, the connection between

masculinity and the automobile, and the culture of freedom and individualism. Practice theorists, who focus on "practices" that people engage in, rather than the people themselves, study the emergence of routines of car use, emphasizing convenience. Efforts to reduce automobile use are directed at constructing alternative infrastructures to encourage trips without cars, the promotion of public transit and attempts to change the social meanings of private autos, and frequently take the form of using social networks to induce behavioral change. Summing up this perspective, and the gap between pro-environmental attitudes and behaviors, Michael Bell writes in his influential environmental sociology textbook: "One of the main reasons people find their attitudes at odds with their behaviors . . . is social structure. We do not have complete choice in what we do. Our lives are socially organized" (Bell 2012: 225).

III. Explaining Consumption Upscaling

Social Status and Peer Influences

Within sociology, approaches that emphasize the role of status motives in consumer actions have a long and influential history. In 1899 Thorstein Veblen published his classic book *Theory of the Leisure Class* (1899), which painted a picture of elites who vied for position and prestige through publicly visible consumer goods, such as mansions, carriages, apparel, and accessories. The visibility of consumer patterns, or what Veblen termed conspicuous consumption, is key to this system as it "puts in evidence" the wealth underlying the conspicuous lifestyle. Status theories predict ongoing competition as income grows, and because status is positional, or "relative," income growth creates a persistent pressure to keep up. This "treadmill of consumption" can be exacerbated by increased inequality, advertising and marketing, or cultural messages that stress consumption (Schor 1997; Bell 2012, ch 2). While there is not a large explicit literature on the relation between status consumption and environmental outcomes, the growth of home size, automobile age and weight, long distance travel, and the rarity of personal adornment items (e.g. jewelry) all have heavy ecological impacts. Consumption competitions also diffuse products that have historically been luxuries on account of their high (ecological) cost into mass produced

items. These include products such as shrimp, cashmere, leather, and precious gems, and all of which are ecologically intensive (Schor 2010). Indeed, a key dynamic of contemporary consumerism is the transformation of ecologically expensive luxuries into unsustainable commodities. Here the dynamic is less elite consumption than mass purchasing. A related dynamic has been the speed-up of the fashion cycle in manufactured goods (Schor 2010). From the early 1990s until the Great Recession, consumers in the U.S. and elsewhere increasingly acquired cheap goods. The build-up of consumers' inventories led to increased discard and purchase of new items. This cycle of purchase and discard has heavy ecological and carbon impacts. Schor (2010; 2013) has argued that this fast fashion culture leads to the "social death" of products as their symbolic value declines more quickly than their functionality. This in turn raises the ecological intensity of consumption, as the demand for new products increases. Other researchers have identified planned obsolescence as another cause of frequent purchases.

Theories of status and competitive consumption provide an explanation for the attitude-behavior gap that has been a major focus of psychologically-oriented researchers of environmental behavior. These approaches suggest that personal values do not motivate consumer action so much as the desire to keep up with consumption trends and norms within the social strata an individual is attempting to belong to. Work on reference groups and peer influence (Cialdini 2003; Schor 1997) finds that these social effects are a strong influence on behavior. Individuals may tell surveyors they care about the environment but if their social reference group is engaging in a high-impact lifestyle, this approach predicts that will be a more important determinant of consumer behavior.

There are relatively few studies that explicitly test the importance of Veblenian status competitions on environmental behaviors. One implication of status theories is that consumers will spend more per purchase and purchase more when goods are used publicly. Chao and Schor (1998) found that women are more likely to buy expensive lipsticks (which are taken out in public) than other cosmetics whose use is confined to the home, even when lipstick brands are functionally equivalent. In a study of Scandinavian consumers, Pedersen (2000) found that people are more likely to choose low-impact food,

energy, and other environmentally significant items when they are socially visible, as well as tangible (Pedersen 2000). Mau et al. (2008) studied the diffusion of hybrid vehicles and found that in neighborhoods, there was a demonstration effect which encouraged additional purchases. The importance of status in the consumption of environmentally beneficial products was also studied by Griskevicius et al (2010) using lab experiments. They found that after consumers were primed for status considerations, they were more willing to purchase green products, but that this effect did not hold for products that were only consumed in private.

Social psychologist Robert Cialdini and his collaborators have studied environmental behaviors in the context of peer influence. Although they do not take into account sociological variables such as class, which are key to status theories, their approach is conceptually close to that done by sociologists. Cialdini and associates find that energy use is influenced by information about the ways social others are consuming (Schultz, Nolan, Cialdini, & Griskevicius 2007). Based on this research, Cialdini helped develop a nationwide effort to reduce gas and electricity energy consumption through tailored messages to households in which they are sent information about how their consumption compares to others. Researchers found that those with higher than average consumption reduced their levels, however households with lower than average consumption increased their use after seeing the comparison. Over time, messages have been adjusted to try and induce conservation by all groups, using new tactics, such as emoticons, and multiple reference groups (e.g., consumers with low usage get comparisons to other low usage consumers). Cialdini and his collaborators have also studied hotel programs to encourage towels and sheet reuse and find that messages that inform guests that other guests have used the programs lead to considerably larger uptake, in comparison to standard communication that does not include references to social others (Goldstein et al 2008).

Veblenian status theory uses a one-dimensional economic model in which higher-priced goods yield more status, and social ordering is determined by wealth. In his study of lifestyles, French sociologist Pierre Bourdieu (1984) added another dimension, which he termed cultural capital. The mix of

economic and cultural capital informs the habitus, or the ingrained set of tastes, demeanors and dispositions each person has. This perspective has informed studies of the class character of environmental choices. In contrast to studies from the 1970s and 1980s, which found that pro-environmental values are common across all social classes, more recent research finds that environmental concern and "green" products are socially coded as associated with higher socio-economic status. Laidley's (2013) qualitative research in a Northeastern urban area found that across his mixed-income sample, people articulated the "Maslovian" trope that the environment is a concern for the well-to-do, who can afford to worry about it, while low-income people are too preoccupied with economic survival. One study found that eco-products were thought to be for the "rich and elite" (Bennett and Williams 2011). Similarly, an analysis of U.S. Hummer drivers by consumer researchers found that they characterize Prius drivers as elite and un-American (Luedicke, Thompson and Giesler 2009). A paradoxical dimension of the coding of green products and practices as "elite" is that many of the most sustainable ways of living describe the lifestyles of poor and low income households, in both the global North and South. These include examples such as using bicycles rather than cars, growing and preparing one's own food, air drying of clothing, using public transportation, and diets low in meat consumption and high in grains and legumes. Wealthier households have higher eco- and carbon-footprints, yet the foregoing research suggests that they are more likely to be seen as environmentalists.

One reason for the popular association between elite status and environmental concern may be the rise of a particular pro-environmental cultural outlook. Carfagna et al (2014) have found that those who are high in cultural capital have developed an "an eco-habitus," in which ecological values are a key structuring principle of consumer tastes. (See also Elliott 2013 who finds a positive association between "green" consumption and education.) There is now a considerable growth in (and literature about) "sustainable consumption" (see below) which can be interpreted through the lens of the eco-habitus. Carfagna et al (2014) argue that the habitus includes values such as the desire to eat locally (to avoid food miles) and to eat organic food, respect for the materiality of products, and a preference for home-made

and DIY consumption. Perhaps paradoxically, having an eco-habitus does not necessarily entail having a low eco- or carbon footprint, as there are aspects of this high cultural capital lifestyle that are ecologically intensive, such as long distance travel. However, the eco-habitus does represent an altered rationality to consumption, along the lines of what ecological modernization theorists predicted.

Habits, Routines and Practice Theory

Postwar British sociology was heavily influenced by Anthony Giddens, who rejected class based approaches, such as those of Veblen and Bourdieu, in favor of explanations of behavior that were rooted in an analysis of stages of capitalist society (Giddens 1991). Giddens argued that the contemporary period, which he termed "high modernity," was characterized by individualized behavior, rooted in personal narrative and reflexivity. One influential study of environmental consumption using these insights suggested that people were hampered by the uncertainties associated with their consumer decisions, and reflexive complexity of the consumer choices they are routinely faced with (Connolly and Prothero 2008). In the 1990s, British sociologist Elizabeth Shove and her collaborators began studying environmentally important consumption by rejecting status and class based theories, and focusing on more Giddensian ideas of everyday life. These researchers began by looking at "inconspicuous" consumption, which entailed a shift from studying consumer goods to household systems, such as the use of energy and water (Gronow and Warde 2001; Shove and Warde 2002). They focused on motives such as comfort, cleanliness and convenience to explain rising water and energy use in British households (Shove 2003). In a series of studies, they chronicled changing habits among the U.K. population. Three influential studies looked at the shift to daily bathing (Hand, Shove and Southerton 2005), the rising prevalence of freestanding freezers (Hand and Shove 2007), and changing norms of heating and cooling to a more constant year-round temperature, and with it, higher energy use (Shove 2003). These accounts, which are largely descriptive, identify economic trends such as rising incomes, daily life stresses of time use, and changing leisure patterns as key to the increase in resource use among Britons.

An animating feature of this literature was the rejection of the individualist, rational model of consumer behavior. Shove, Southerton, and collaborators argued that people are not driven by conscious, deliberate choice, but by habit, social norms and ingrained routines. Hence, the dominant policy approaches, which focus on price and information, are misguided, which is what accounts for their failure to reduce the volume and ecological intensity of consumption (Shove 2010). The rejection of the causal model of attitudes and value driving consumption led this group of researchers to embrace practice theory (Schatzki et al. 2001), an approach that takes as its unit of analysis not the individual but a social practice. They began to study how the combination of technology, material artefacts, and skill results in practices which have environmental consequences (Shove et al 2012). While this approach became quite popular in Europe, and to a lesser extent in the U.S., its insights for achieving sustainable consumption have been modest. One study of Japanese offices found that employees were better able to adapt to reduced energy use when a more casual dress code was introduced that allowed them to forego suits and ties for hot weather appropriate apparel (Southerton et al 2011). However, one promising area is the timing of energy demands. If social practices, or structures dictate when resource-intensive consumption occurs, then attempts to shift consumption away from peak demand may not be successful, even with price incentives. Furthermore, time stress may reduce the prevalence of more sustainable, but time-consuming practices and activities. Focusing on practices also reveals that achieving sustainability in consumption will typically require significant change in the organization of daily life. In this way both practice-based and status approaches recognize the strong role that social structures play in determining consumption patterns and trends. They share a rejection of the individualist approach.

The Global Middle Class

Our discussion so far has focused mainly on the U.S. and the global North, in line with the 1992 formulation associated with the UN Conference on Environment and Development. However, since then, consumption in the global South has increased dramatically, as has the environmental impact of global South nations. India, China and Brazil particularly have seen increased footprints in terms of energy use

and deforestation. Although global trade is a big part of this footprint, dramatic growth of a global middle class is one of the most important developments since 1992 in the area of consumption and environment.

By many accounts, a global middle class is rising to fill the gap between the poor and the wealthy, leading to an overall decline in poverty rates (Edward 2006). Some figures put the middle class at 3.2 billion people worldwide at the end of 2016 (Kharas 2017). What constitutes the cut-offs for this group is contested, especially regarding the emerging middle classes in developing nations. One way to define the middle class that takes into account these variations is to count households with per capita incomes of $10-100 per day, in terms of purchasing power parity (Kharas 2017). This group constitutes a new base of consumers, for the products of multinational corporations especially. This consumption poses a problem for the environment, especially considering that the current consumption levels of Western middle classes is unsustainable (Krishna 2015). Middle class lifestyles are associated with higher carbon emissions and increased resource consumption. However, the middle class also represents a hallmark of modernization and is seen as beneficial to developing nations, as well as an essential element of their continued development (Lama and Sened 2018). Other aspects of a growing middle class such as increased urbanization and shrinking family sizes, could mitigate some of the potential environmental impacts (Kharas 2017).

Particular consumption habits separate the middle classes from the poor, and these habits all come with a large environmental impact. The consumption of cars and meat, which are both highly resource intensive, increases with the rise of the middle class in developing nations (Myers and Kent 2004). Cars contribute to carbon emissions, poor air quality in many large cities in the global South, and gridlock. Meat consumption requires large amounts of grain to raise livestock, which strains an already limited and important source of food for the poor, in addition to environmental impacts. Livestock production is also water intensive, and creates high levels of methane, a potent greenhouse gas. Other consumption patterns of the global middle classes include increased spending on entertainment, the

purchase or rent of larger homes, and an overall focus on spending to improve the quality of life rather than to maintain it (Banerjee and Duflo 2008).

Despite similarities, researchers have also noted variation in middle classes, especially in developing nations. However, theories of consumption have been grounded in Western contexts, and little consideration has been given to how they might vary in global South nations (Üstüner and Holt 2010). This study of conspicuous consumption in Turkey showed that lower cultural capital consumers focused their consumption field locally, while high cultural capital consumers pursued the tastes and practices of the West through numerous (carbon intensive) foreign trips, rather than simply via the accumulation of Western goods. This diverges from the prediction that consumers in the global South merely copy the consumption patterns of global North nations. Instead, they are pursuing capital accumulation strategies that vary by their amounts of cultural capital: either delimiting the field of status competition to the local, or attempting to attain a form of delocalized, international cultural capital. In another variation of conspicuous consumption, one study in South Korea demonstrated that education was commodified and provided an important avenue for distinction (Koo 2016). Middle class Korean parents spent time, effort, and money to send their children to high quality private schools, and later to American universities, a carbon intensive practice.

The focus on conspicuous consumption ignores the fact that the global middle classes also incorporate ethical considerations into their consumption practices. A study in South Africa found that thrift was an important ethical consideration for the middle class, as thrift was framed as taking the needs of others into consideration by not "wasting" money (McEwan et al. 2015). However, saving money was a larger motivator than concern about wasting material commodities. Despite assumptions that the global middle classes will follow the path set by Western consumers, there is growing evidence of the possibility that divergence from Western consumption patterns could lead to new, more sustainable lifestyles.

IV. A Future for Sustainable Consumption?

Technology & Consumption

Technology, especially Information and Communication Technologies (ICTs), has become increasingly integrated into daily routines of households, especially since the beginning of the 21st century. In 2000, just over 50% of US adults used the internet; in 2016, that figure was 88%. In 2016, 73% of US adults had broadband internet at home, compared to 1% in 2000. New consumer electronics have also been quickly adopted: in 2016, 77% of US adults owned a smart phone, up from 35% in 2011, and 51% owned a tablet, up from 3% in 2010 (Smith 2017). The increased consumption of technology means that daily practices are increasingly intertwined with ICT usage. Examples include the usage of ICTs during "dead time," such as commuting on public transportation, to check email and social media, as well as the increase in multitasking by engaging in activities on multiple devices, both of which can lead to increased energy usage (Røpke and Christensen 2012). ICT usage can delocalize practices, making them more energy efficient – for example, computers have enabled many people to work from home, eliminating the need to commute. However, it can also increase resource consumption – for example, by making it easier to purchase a variety of products through online shopping. Mobile devices in particular have encouraged both delocalization and multitasking (Røpke et al. 2010). As technology is increasingly integrated into everyday life, it is seen as a necessity – especially by younger people and the highly educated (Aro and Wilska 2014). However, the impact of increasing technology consumption on the environment is not straightforward: ICTs have the potential to increase resource efficiency as well as increase resource consumption.

ICTs have been hailed alternately as a pathway to sustainability and environmental harm mitigation or an engine of economic growth and environmental degradation. Estimations from 2010 show that the ICT sector is responsible for 1.7% of greenhouse gas (GHG) emissions and 3.9% of global electricity use (Malmodin et al. 2010). These emissions may have stabilized: an analysis of the carbon and energy footprint of the ICT sector for 2015 found that levels have remained similar to those from 2010. However, the full impact of ICTs on the environment is difficult to estimate, because the sector is so

broad. It ranges from the individual level, with personal device usage, to the macro level of cloud computing and energy infrastructure (Williams 2011). Models of environmental outcomes, such STIRPAT, do take technology into account. However, technology is typically treated as a residual impact, unaccounted for in the model (York, Rose, and Dietz 2003).

A common misconception about ICT, often leading to greenwashing of the sector, is that it is untethered to the material world (Maxwell and Miller 2013). This view, reflected in terms such as "cloud computing," is far from an accurate picture. The production and operation of ICTs involve massive amounts of material resources and energy (van den Bergh et al. 2009), and their disposal poses special problems. Electronic waste yields health problems because the waste is often "recycled" by workers in developing nations who lack adequate physical protection. This toxic waste can also contaminate the surrounding environment (Maxwell and Miller 2013; Williams 2011; Patrignani and Whitehouse 2015). The paradoxical view of ICTs as immaterial, even though they require significant energy and material resources, echoes Schor's materiality paradox: that consumption for non-material meanings creates more material waste (2010).

Those skeptical of ICT's ability to solve more environmental problems than they create emphasize rebound effects, a lack of decoupling and dematerialization, and increased resource usage as possible outcomes of ICT usage. Longo and York (2015) tested the theory that ICTs can help reduce the production and consumption of energy and found that ICTs show no signs of helping conserve resources, and could possibly increase resource usage. The potential of ICTs to decouple consumption from materials is often seen as a way to foster economic growth while also reducing environmental degradation. Decoupling from both material resources and environmental impacts is the basis for the ideal of sustainable development (Hilty et al. 2011). However, while ICTs have the potential to encourage efficiency and decoupling, prioritizing economic growth will likely negate these beneficial capacities (Longo and York 2015; Hilty et al. 2011). Rebound effects are one possible reason decoupling could fail: as ICTs become more efficient themselves and also contribute to the reduction of energy-intensive

production and renewable energy the resulting cheaper energy prices could lead to greater consumption of energy (Moyer and Hughes 2012). Dematerialization also depends on the decoupling of consumption and material goods. Van den Bergh's study (2009) testing the ability of ICTs to contribute to dematerialization found that results varied: ITC's effect on economic growth and international trade had negative effects, but increased access to information and substitution through ICTs had a positive effect.

While ICTs might not inherently be "good" for the environment, there are ways in which their problematic impacts can be mitigated, or they can be employed in ways that benefit the environment. One such possibility is provided by Slow Tech, a framework for mitigating the environmental impacts of ICTs by applying the principles based on those developed by the slow food movement – good, clean, and fair technology – as well as actually "slowing down" both the production and consumption of technology (Patrignani and Whitehouse 2014 & 2015). Another avenue is through the emergence of a knowledge economy enabled by ICTs, which could lead to less intensive energy use and pollution as compared to other economies (Houghton 2009). However, this approach would require additional effort beyond the implementation of ICTs: taking advantage of the information made available by ICTs, and the ability to communicate this information, is necessary for such technologies to be truly "green."

Many people also use ICTs to manage their own environmental impact: daily practices integrating ICTs, such as innovative monitoring systems, allow users to systematically analyze and reduce their own consumption (Lorenzen 2012b). Other tactics include those of voluntary simplifiers, who extend their use of technologies in order to avoid consuming too many new goods and creating waste. Internet usage has also been shown to encourage those with pro-environmental attitudes to transform those beliefs into actions and engage in sustainable consumption (Wang and Hao 2018). Access to information on sustainability that is widely available on the internet makes it easier for consumers to make "greener" choices. Many ICT users are not passively consuming technology; rather they are finding innovative and sustainable ways to use technology.

Sustainability and New Consumer Practices

In a number of environmentally-significant sectors, sustainable alternatives are emerging, which raise the possibility of less damaging consumption. The transformation has been most far-reaching in food, but steps toward a "sustainable consumer culture" are also being taken in household energy, transportation, clothing, travel and other areas. There is a growing sociological literature on what is motivating consumers to live lower-impact lifestyles. In addition to environmental concerns, researchers have found that personal health and saving money are important motives (Lockie et al 2002; Black and Cherrier 2010). While many studies assume that consumers experience motives as independent factors, the Bourdieusian approach argues that the habitus is a holistic construct, and that an ecological orientation is interwoven with multiple rationales (Carfagna et al 2014; Kennedy, Baumann and Johnston 2018). There is also divergence of opinion among sociologists about the significance of sustainable consumption. While none think that consumer behaviour is a sufficient condition for achieving sustainability, some are more optimistic than others that consumers can have any impact on structures of unsustainability. The pessimists often adopt a co-optation or conventionalization narrative (Guthman 2014) which predicts minimal positive ecological change. Others believe that consumer actions, particularly those that are collective, can induce some transformation (Willis and Schor 2012). We return to this issue below.

The sector that has seen the most activity to achieve sustainability is food. The alternative food movement encompasses production, distribution and consumption, and actors in each sphere oppose the corporate food regime for its impacts on the planet, human health and the well-being of farmers and (less routinely) farmworkers (McMichael 2000, Alkon and Agyeman 2011). Consumers are embracing local food, shortened supply chains, organic farming techniques, and new distribution models such as Community Supported Agriculture, as well as ideals of community associated with earlier agricultural eras (Bell 2004, Lyson 2004). Early discourses focused on teaching the consumer where their food comes from, on the assumption that education would be sufficient to transform behaviors. However, sociologists and others have critiqued simplistic models of localism on a number of grounds—romanticism,

inattention to issues of farm labor, failure to consider issues of race and class, and faulty carbon accounting (Hinrichs 2003; Goodman, DuPuis and Goodman 2011; Alkon and Agyeman 2011). To date, the adoption of "alternative" methods into the corporate food regime suggests that while alternatives are having some beneficial local impacts, there is increased dominance and globalization of industrialized farming, with its highly destructive impacts on ecosystems and human health.

In energy and transportation, there has been rapid growth in ecologically less intensive household products. Both sectors have likely reached the point where high-cost early adopter growth is being exhausted, and further expansion mainly depends on policy and infrastructure. In energy, price declines have resulted in rapid increases in household installations of solar. The market collapsed with the policy uncertainty of 2016-2017, however that disruption may have subsided. Furthermore, a 2018 California mandate that all new home construction include solar capacity is institutionalizing this energy source. Recent research suggests this once niche technology has already begun to spread into the broad middle class (Barbose, Dargouth, Hoen, and Wiser 2018). The process of transformation is farther behind in transportation where the electrification of private vehicles has begun, but still represents less than 2% of the US market. A countervailing trend is the decline of public transportation ridership and the rapid expansion in ridehailing (Clewlow and Mishra 2017). However the ridehailing platform Lyft now purchases carbon offsets for all rides.

Sustainable consumption is also leading to the emergence of alternative practices in housing, such as eco-villages (Litfin 2013) and co-housing, in which common areas allow individual households to reduce their personal housing space. Eco-village residents also commit to low-impact living. A few developments have even instituted "One Planet Living," which means an ecological footprint of roughly 2 hectares per person (Schor 2010). Consumers are also attempting to reduce their footprints by participating in a variety of second-hand markets. These include clothing, toy, book and other goods swapping or resale schemes; gifting platforms such as freecycle; and commercial platforms like eBay and Craig's list (Schor and Fitzmaurice 2015; Nelson, Rademacher and Paek 2007). A related trend is the

emergence of repair sites for electronics and appliances that offer free or low-cost repair to induce people not to purchase new items. Commercial "sharing economy" platforms such as Airbnb and Uber/Lyft which were founded in the late 2000s attempted to motivate consumers by arguing they are reducing eco-footprints. In the case of ride-hailing (originally called "car sharing") the claim was reduced car ownership. Airbnb claimed it led to fewer hotels being constructed. Our survey research suggests that large majorities took these claims at face value. However, these claims are not supported by evidence. Ride-hailing is reducing public transit use and increasing trips in private vehicles. Impacts on car ownership are relatively small (Clewlow and Mishra 2018). Airbnb is likely increasing travel by reducing lodging costs (Schor 2020).

A final trend is a shift out of lifestyles that entail long hours of work and high expenditures (Schor 1992) toward "downshifting" and voluntary simplicity. In 2004, 48% of respondents in a U.S. poll reported having downshifted in the previous five years, defined as having voluntarily given up income (Schor 2010). The downshifting trend has also been identified in the U.K. and Australia, as well as other countries (Craig-Lees and Hill 2002; Hamilton and Denniss 2005). The voluntary simplicity movement is a small subset of downshifters, who are explicitly critical of consumer culture and attempting to reduce their environmental footprints by reducing consumption overall (Schor 1997; Alexander 2009; Willis and Schor 2012). Voluntary simplifiers have been shown to have significantly lower eco-footprints than typical Americans (Kasser and Brown 2003).

While there is a growing trend of people who are attempting to consume "consciously" (Brown 2009; Schor 2010; Willis and Schor 2012; Kennedy, Johnston and Baumann 2018) these practices and lifestyles raise complex issues and can be difficult to enact. Conolly and Prothero (2008) studied a small group of environmentally-committed consumers, but found that they were often skeptical and uncertain about the shopping choices they were confronted with. One respondent in this qualitative study lamented the difficulties of balancing cost and eco-impact, and detailed her indecision about whether she should buy organic chicken for her pet. A proliferation of "ethical" certifications has meant that consumers are

forced to research products in ways that they often find stressful (Schwartz 2004; Conroy 2007). Some scholars have argued that couching environmental consumption within a neo-liberal framing undermines actual footprint reductions (Hobson 2002). Kennedy, Baumann and Johnston (2018) find that status and ethical concerns combine in complex ways, with consumers clustering into distinct groups. There are also debates in the literature about whether an initial environmentally beneficial purchase leads to more or less future green purchasing. Using experimental data, psychologists Mazar and Zhong (2010) argue that one "green" purchase leads to moral license for future high-impact choices. However, sociologists have found that initial purchases of green products can lead to further similar purchases and the adoption of a more generalized green lifestyle (Lorenzen 2012a; Evans and Abrahamse 2009). Another debate in the literature is about the relation of environmental purchases to collective action. Szasz (2007) has argued that purchasing environmental products such as bottled water leads consumers to enact a kind of "inverted quarantine," which then reduces their propensity to engage in the only kinds of activities—political voice and social movement activism—that will be effective. However, all the studies that address this claim find that activism and environmental purchasing are strongly correlated (Willis and Schor 2012; Forno and Ceccarini 2006; Barnett et al 2005). Nevertheless, the structural nature of environmental degradation means that consumer actions will never be sufficient to create a sustainable economy and society. Sociological analysis leads scholars to the understanding that consumers *qua* consumers will have only a limited role to play in the transition to sustainability. Indeed, it is likely that only a fortuitous combination of social movement pressure with favorable economic, political and technological trends will yield ecological sustainability.

V. Conclusion

There are growing classes of new consumers: those of the global middle class, some of whom are copying the resource-intensive lifestyles of the West, as well as those all over the world who are pursuing alternative, sustainable lifestyles. These groups raise an important question: what will the consumption trends of the future be? And how will these consumption trends impact climate change, for better or for

worse? At the time of this writing, the Intergovernmental Panel on Climate Change (IPCC) has just released a report on the social and environmental impacts global warming of 1.5°C, as well as the benefits of avoiding further warming even at levels previously considered "safe" (IPCC 2018). However, this report still neglects the disproportionality of responsibility for global warming: the lifestyles of 10% of the global population are accountable for 50% of global carbon emissions (Anderson 2018). Environmental problems caused by global warming will continue to accelerate unless the emissions generated by these high emitters – residents of developed nations and the ultra-wealthy of the world among them – are limited.

The essential task in coming decades is the need to dramatically transform expenditure patterns, interrupt the "treadmill of consumption," and re-orient economies all over the world to meet human needs in an equitable way. For sociologists of consumption and the environment, this requires a critical analysis of consumption—especially the ways in which inequality drives expenditures and the impacts of spending on human well-being. How can we downscale consumption in a way that meets criteria of climate justice, both within and across regions of the world? The expanding literatures on food justice, energy transformations and sustainable consumption have begun to point to answers to this daunting task. While we don't yet know the shape of the consumption regimes of the future, we do know they will need to be very different from current patterns and levels if the world is to avoid truly catastrophic climate and other ecological impacts.

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